

Publications

Theses:

Habilitation thesis: **Schmickl T. (2012)** “*The Collective Physiology of the Swarm: Modelling Self-Organization, Self-Regulation and Swarm-Intelligence of Distributed Systems in Biology and Bio-Robotics*”, Karl-Franzens University Graz.

Ph.D.-Thesis: **Schmickl T. (2001)** "Regulation of brood development in the honeybee (*Apis mellifera* L.): Feedback mechanisms and survival strategies of a superorganism", University of Graz.

Master-Thesis: **Schmickl T. (1998)** “Die Erfassung des mikrobiologischen Status in der Innenraumluft von Krankenanstalten“, University of Salzburg. ("Assessment of the microbiological status of the indoor-air in styrian public hospitals").

Editing of special issues in scientific journals:

Hamann H., **Schmickl T. (2011)** Special Issue: “*Modelling the Swarm – Analysing biological and engineered swarm systems*” in ***Mathematical and Computer Modelling of Dynamical Systems***, Taylor & Francis. DOI: 10.1080/13873954.2011.601426.

Peer-reviewed articles in journals, series and proceedings:

1. Varughese, J. C., Hornischer, H., Zahadat, P., Thenius, R., Wotawa, F., **Schmickl, T.** (in press). A swarm design paradigm unifying swarm behaviors using minimalistic communication. *Bioinspiration & Biomimetics*, 16(2).
2. Wahby, M., Heinrich, M.K., Hofstadler, D.N., Petzold, J., Kuksin, I., Zahadat, P., **Schmickl, T.**, Ayres, P., Hamann, H. (2019) Robotic Sensing and Stimuli Provision for Guided Plant Growth. <https://www.jove.com/video/59835/robotic-sensing-and-stimuli-provision-for-guided-plant-growth> DOI: doi:10.3791/59835
3. Bonnet F., Mills R., Schönwetter-Fuschs S., Szopek M., Halloy J., Bogdan S. Correia L., Mondada F., **Schmickl. T. (2019)** Robots mediating interactions between animals for

- interspecies collective behaviors. *Science Robotics* 4(28), eaau7897, DOI: 10.1126/scirobotics.aau7897
4. Heinrich M.K., von Mammen S., Hofstadler D.N., Wahby M., Zahadat P., Skrzypczak T., Soorati M.D., Krela R., Kwiatkowski W., **Schmickl T.**, Ayres P., Stoy K., Hamann H. (2019) Constructing Living Buildings: A Review of Relevant Technologies for a Novel Application of Biohybrid Robotics. *Journal of the Royal Society Interface* 16, DOI 10.1098/rsif.2019.0238
 5. Varughese, J., Hornischer, H., Thenius, R., Wotawa, F., **Schmickl, T.** (2019) In: Fellermann, H., Bacardit, J., Goñi-Moreno, A., Fuchslin, R.M. (eds.) *Alife 2019, Collective Event Detection Using Bio-inspired Minimalistic Communication in a Swarm of Underwater Robots*, pp. 634-641
 6. Wahby, M., Petzold, J., Eschke, C., **Schmickl, T.**, Hamann, H. (2019) In: Fellermann, H., Bacardit, J., Goñi-Moreno, A., Fuchslin, R.M. (eds.) *Alife 2019, Collective Change Detection: Adaptivity to Dynamic Swarm Densities and Light Conditions in Robot Swarms*, pp. 642-649
 7. Varughese, J., Moser, D., Thenius, R., Wotawa, F., **Schmickl, T.** (2019) *swarmFSTaxis: Borrowing a Swarm Communication Mechanism from Fireflies and Slime Mold*. In: Ted Carmichael & Andy Collins (eds.) *Complex Adaptive Systems: Views from the Physical, Natural, and Social Sciences*. Norfolk, Virginia, USA. Springer, pp 213-222.
 8. Kengyel D., Zahadat P., Wotawa F., **Schmickl T.** (2019) Towards swarm level optimisation: the role of different movement patterns in swarm systems. *International Journal of Parallel, Emergent and Distributed Systems* 34(3), pp 241-259.
 9. Kimura, T., Ohashi, M., Crailsheim, K., **Schmickl, T.**, Okada, R., Radspieler, G., Isokawa, T., Ikeno, H., (2019) A Heuristic Trajectory Decision Method to Enhance the Tracking Performance of Multiple Honeybees on a Flat Laboratory, In: *J-STAGE*, Volume 32, pp 113-122, doi.org/10.5687/iscie.32
 10. Yang, W-C., **Schmickl, T.** (2019) In: (eds.) *Scientific Reports*, Band 9 (1)T, Collective Motion as an Ultimate Effect in Crowded Selfish Herds, Verlag: Nature Publishing Group

11. Hamann, H., Von Mammen, S., Mauser, I., Ayres, P., Banzhaff, W., Bentley, P., Dittrich, P., Dorigo, M., Doursat, R., Hensen, J., Höhl, W., Jacob, C., Menges, A., Michel, O., Napp, N., Petersen, K., Sayama, H., **Schmickl, T.**, Stoy, K., Theraulaz, G., Werfel, J., Zamuda, A. (2019) In: Proceedings-2018 IEEE 3rd International Workshops on Foundations and Applications of Self* Systems, FAS* W 2018, SOCO 2018 Foreword: 2nd International Workshop on Self-Organised Construction. pp XIX
12. **Schmickl T.**, Karsai I. (2018) Integral feedback control is at the core of task allocation and resilience of insect societies. PNAS 201807684, DOI: 10.1073/pnas.1807684115
13. Wahby M., Heinrich M. K., Hofstadler D. N., Neufeld E., Kuksin I., Zahadat P., **Schmickl T.**, Ayres P., Hamann H. (2018) Autonomously shaping natural climbing plants: a bio-hybrid approach. *Royal Society Open Science* 5(10), 180296.
14. Wahby M., Heinrich M. K., Hofstadler D. N., Zahadat P., Risi S., Ayres P., **Schmickl T.**, Hamann H. (2018) A robot to shape your natural plant: the machine learning approach to model and control bio-hybrid systems. Proceedings of the Genetic and Evolutionary Computation Conference 2018 (GECCO'18), pp 165-172.
15. Varughese, J.C., Hornischer, H., Thenius, R., Zahadat, P., Wotawa, F., **Schmickl, T.** (2018) Introduction to WOSPP: wave oriented swarm programming paradigm. CoRR abs/1804.04202.
16. Zahadat P., **Schmickl T.** (2018) Locomotion as a Result of Displacement of Resources, Proceedings of the Artificial Life Conference 2018 (ALIFE'18), pp 232-233.
17. Mariano P., Salem Z., Mills R., Schönwetter-Fuchs-Schistek S., Correia L., **Schmickl T.** (2018) Evolving robot controllers for a bio-hybrid system. Proceedings of the Artificial Life Conference 2018 (ALIFE'18), pp 155-162.
18. Salem Z., Radspieler G., Griparic G., **Schmickl T.** (2018) Estimating Dynamics of Honeybee Population Densities with Machine Learning Algorithms. Machine Learning, Optimization, and Big Data. MOD 2017. LNCS. vol. 10710. Springer, Cham. 10710 (2018), 309-321
19. Zahadat P., Hofstadler, D., **Schmickl T.** (2018) Morphogenesis as a Collective Decision of Agents Competing for Limited Resource: a Plants Approach. In: Dorigo M., Birattari M., Blum C., Christensen A., Reina A., Trianni V. (eds) Swarm Intelligence. ANTS 2018.

- Lecture Notes in Computer Science*, vol 11172, pp 84-96. Springer, doi : https://doi.org/10.1007/978-3-030-00533-7_7.
20. Varughese, J. C., Thenius, R., Leitgeb, P., Wotawa, F., **Schmickl, T. (2018)** A Model for Bio-Inspired Underwater Swarm Robotic Exploration. In: Felix Breiteneker, Wolfgang Kemmetmüller, Andreas Körner, Andreas Kugi, Inge Troch (eds.) 9th Vienna International Conference on Mathematical Modelling. *IFAC-PapersOnLine*, 51(2), 385-390, DOI: <https://doi.org/10.1016/j.ifacol.2018.03.066>
 21. Thenius, R., Varughese, J. C., Moser, D., **Schmickl, T. (2018)** WOSPP-A Wave Oriented Swarm Programming Paradigm. In: Felix Breiteneker, Wolfgang Kemmetmüller, Andreas Körner, Andreas Kugi, Inge Troch (eds.) 9th Vienna International Conference on Mathematical Modelling. *IFAC-PapersOnLine*, 51(2), 385-390, DOI: <https://doi.org/10.1016/j.ifacol.2018.03.065>
 22. Thenius, Ronald, et al. **(2018)** subCULTron-Cultural Development as a Tool in Underwater Robotics. In: Lewis P., Headleand C., Battle S., Ritsos P. (eds) *Artificial Life and Intelligent Agents. ALIA 2016*. Communications in Computer and Information Science, vol 732. Springer, DOI: https://doi.org/10.1007/978-3-319-90418-4_3
 23. Zahadat, P., **Schmickl, T. (2018)** Evolving Vascular Morphogenesis Controller to Demonstrate Locomotion. In: (eds.) *Proceedings of Artificial Intelligence and Signal Processing (AISP)*. Shiraz, Iran. IEEE. 2017. 6.
 24. **Schmickl T.**, Karsai I. **(2017)** Resilience of honeybee colonies via common stomach: A model of self-regulation of foraging. *PLOS ONE* 12(11): e0188004, DOI: <https://doi.org/10.1371/journal.pone.0188004>
 25. **Schmickl, T. (2017)** Fundamentalism in a social learning perspective: A memetic agent model of vegetarianism, social interaction networks and food markets. In: *2017 IEEE Symposium Series on Computational Intelligence (SSCI)*, Honolulu, HI, 2017, DOI: 10.1109/SSCI.2017.8280876
 26. Oswald, Y., **Schmickl, T. (2017)** Ultimate Ecology: How a socio-economic game can evolve into a resilient ecosystem of agents. In: *2017 IEEE Symposium Series on Computational Intelligence (SSCI)*, Honolulu, HI, 2017, DOI: 10.1109/SSCI.2017.8280876

27. Stefanec, M., Szopek, M., Mills, R., **Schmickl, T. (2017)** Governing the swarm: Controlling a bio-hybrid society of bees & robots with computational feedback loops. In: *2017 IEEE Symposium Series on Computational Intelligence (SSCI)*, Honolulu, HI, 2017, DOI: 10.1109/SSCI.2017.8280876
28. Donati E., van Vuuren G.J., Tanaka K., Romano D., **Schmickl T.**, Stefanini C. (2017) aMussels: Diving and Anchoring in a New Bio-inspired Under-Actuated Robot Class for Long-Term Environmental Exploration and Monitoring. In: Gao Y., Fallah S., Jin Y., Lekakou C. (eds.) *Towards Autonomous Robotic Systems. TAROS 2017. Lecture Notes in Computer Science*, vol 10454. Springer, DOI: 10.1007/978-3-319-64107-2
29. Varughese, J., Thenius, R., **Schmickl, T.**, Wotawa, F. (2017) Quantification and Analysis of the Resilience of Two Swarm Intelligent Algorithms. In: Christoph Benzmüller, Christine Lisetti and Martin Theobald (eds.) *GCAI 2017. 3rd Global Conference on Artificial Intelligence*. Miami, Florida, USA. EPiC Series in Computing. 2017. 148 - 161. DOI:10.29007/5fhn
30. Hofstadler D. N., Wahby M., Heinrich M. K., Hamann H., Zahadat P., Ayres P., **Schmickl T. (2017)** Evolved Control of Natural Plants: Crossing the Reality Gap for User-defined Steering of Growth and Motion. In: *ACM Transactions on Adaptive and Autonomous Systems (TAAS)*, 2, 3, Article 15, DOI: <https://doi.org/10.1145/3124643>
31. Zahadat P., Hofstadler D. N., **Schmickl T. (2017)** Development of Morphology Based on Resource Distribution: Finding the Shortest Path in a Maze by Vascular Morphogenesis Controller. In: *14th European Conference on Artificial Life (ECAL 2017)* 4-8 September 2017, Lyon, France, DOI: 10.7551/ecal_a_071
32. Mariano P., Salem Z., Mills R., Zahadat P., Correia L., **Schmickl T. (2017)** Animal-guided evolutionary computation in honeybees and robots. In: *Proceedings of the European Conference on Artificial Life (ECAL 2017)* 4-8 September 2017, Lyon, France, DOI: 10.7551/ecal_a_085
33. Szopek M., Stefanec M., Bodi. Radspieler G., **Schmickl T. (2017)** A cellular model of swarm intelligence in bees and robots. In: *Proceedings of the 10th EAI International Conference on Bio-inspired Information and Communications Technologies (BICT 2017)*, DOI: <http://dx.doi.org/10.4108/eai.22-3-2017.152396>

34. Stefanec M., Szopek M., Thenius R., Radspieler G., **Schmickl T.** (2017) Robotic oligarchy: How a few members can control their whole society by doing almost nothing. In: *Proceedings of the 10th EAI International Conference on Bio-inspired Information and Communications Technologies (BICT)*, DOI: <http://dx.doi.org/10.4108/eai.22-3-2017.152412>
35. Polic M., Salem Z., Griparic K., Bogdan S., **Schmickl T.** (2017) Estimation of moving agents density in 2D space based on LSTM neural network. In: *Proceedings of Evolving and Adaptive Intelligent Systems conference (EAIS 2017)*, DOI: 10.1109/EAIS.2017.7954842
36. Zahadat P., Hofstadler D. N., **Schmickl T.** (2017) Vascular Morphogenesis Controller: A Generative Model For Developing Morphology of Artificial Structures. In: *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO '17)*. ACM, New York, NY, USA, 163-170, DOI: <https://doi.org/10.1145/3071178.3071247>
37. Mariano P., Salem Z., Mills R., Zahadat P., Correia L., **Schmickl T.** (2017) Design choices for adapting bio-hybrid systems with evolutionary computation. In: *Proceedings of the Genetic and Evolutionary Computation Conference Companion (GECCO '17)*. ACM, New York, NY, USA, 211-212, DOI: <https://doi.org/10.1145/3067695.3076044>
38. Salem Z., Radspieler G., Griparic K., **Schmickl T.** (2017) Estimating Dynamics of Honeybee Population Densities with Machine Learning Algorithms. In: Nicosia G., Pardalos P., Giuffrida G., Umeton R. (eds) *Machine Learning, Optimization, and Big Data. MOD 2017. Lecture Notes in Computer Science*, vol 10710. Springer, DOI: https://doi.org/10.1007/978-3-319-72926-8_26
39. Hofstadler, D.N., Zahadat, P., **Schmickl, T.**, (2017) Vascular Morphogenesis Controller: Guiding Morphology by Competition for Resource Distribution. In: *Proceedings of the Morphogenetic Engineering Workshop, at the European Conference on Artificial Life (ECAL) 2017 September 4, 2017.*
40. Kimura, T., Ohashi, M., Okada, R., Crailsheim, K., **Schmickl, T.**, Radspieler, G., Isokawa, T., Ikeno H. (2017) Automatic tracking method for multiple honeybees using backward-play movies. In: *Proceedings of the IEEE 2017 6th International Conference on Informatics, Electronics and Vision & 2017 7th International Symposium in Computational Medical and Health Technology (ICIEV-ISCMHT)*, pp. 1-4.

41. Moser D., Thenius R., **Schmickl T.** (2017) First Investigations into Artificial Emotions in Cognitive Robotics. In: Husty and Hofbauer (eds.): Medical and Service Robotics: Proceedings of the 5th International *MESROB* workshop, Graz, Austria, 4th - 6th July 2016. Springer, DOI: https://doi.org/10.1007/978-3-319-59972-4_16
42. Mills R., Szopek M., Bodi M., **Schmickl T.** (2016) Correia Luís On the timescale of interactions in bio-hybrid systems. In: Eds. Carlos Gershenson, Tom Froese, Jesus M. Siqueiros, Wendy Aguilar, Eduardo J. Izquierdo and Hiroki Sayama (eds.) Late Breaking Abstracts booklet Artificial Life Conference 2016. 15-16.
43. Zahadat P., **Schmickl T.** (2016) Division of Labor in a Swarm of Autonomous Underwater Robots by Improved Partitioning Social Inhibition. *Adaptive Behavior* 24(2), 87-101, DOI: <https://doi.org/10.1177/1059712316633028>
44. **Schmickl T.**, Stefanec M., Crailsheim K. (2016) How a life-like system emerges from a simple particle motion law. *Scientific Reports* 6: 37969, DOI: 10.1038/srep37969
45. Karsai I., Montano E., **Schmickl T.** (2016) Bottom-up ecology: an agent-based model on the interactions between competition and predation. *Letters in Biomathematics* 2016, pp. 161-180; Vol. 3, NO 1. DOI: <http://dx.doi.org/10.1080/23737867.2016.1217756>
46. **Schmickl T.**, Karsai I. (2016) How regulation based on a common stomach leads to economic optimization of honeybee foraging. *Journal of Theoretical Biology* 389: pp. 274–286, DOI: 10.1016/j.jtbi.2015.10.036
47. Zahadat P., Hofstadler D. N., **Schmickl T.** (2016) Vascular Morphogenesis Controller: A Distributed Controller for Growing Artificial Structures. In: Sameh Elnikety, Peter R. Lewis and Christian Müller-Schloer (eds.) Proceedings of the IEEE International Workshops on Foundations and Applications of Self* Systems. *SASO 2016*. 12.-16. September 2016, Augsburg, Germany. DOI:10.1109/FAS-W.2016.66.
48. Zahadat P., **Schmickl T.** (2016) Division of Labor in a Swarm of Autonomous Underwater Robots by Improved Partitioning Social Inhibition. *Adaptive Behavior* (2016), DOI: <https://doi.org/10.1177/1059712316633028>
49. Dauschan M., Thenius R., Crailsheim K., **Schmickl T.** (2016) Organising body formation of modular autonomous robots using Virtual Embryogenesis. In: Husty and Hofbauer (eds.): Medical and Service Robotics: Proceedings of the 5th International *MESROB*

- workshop, Graz, Austria, 4th - 6th July 2016. Springer, DOI: https://doi.org/10.1007/978-3-319-59972-4_6
50. Varughese J.Ch., Thenius R., Wotawa F., **Schmickl T. (2016)** FSTT Algorithm: Can Tides Assist Bio-Inspired Gradient Taxis? In: M. Husty and M. Hofbaur (eds.): Medical and Service Robotics: Proceedings of the 5th International MESROB workshop, Graz, Austria, 4th - 6th July 2016. Springer, DOI: https://doi.org/10.1007/978-3-319-59972-4_23
51. Varughese J. Ch., Thenius R., Wotawa F., **Schmickl T. (2016)** FSTaxis Algorithm: Bio-Inspired Emergent Gradient Taxis. In: Carlos Gershenson, Tom Froese, Jesus M. Siqueiros, Wendy Aguilar, Eduardo J. Izquierdo and Hiroki Sayama (eds.): Proceedings of the Artificial Life Conference *ALIFE'16*. Mexico. MIT Press. 2016. 330 – 338, DOI: https://doi.org/10.1162/ecal_a_0055
52. Kengyel D., Zahadat P., Kunzfeld T., **Schmickl T. (2016)** Collective Decision Making in a Swarm of Robots: How Robust the BEECLUST Algorithm Performs in Various Conditions. Research Article in European Union Digital Library, DOI: <http://dx.doi.org/10.4108/eai.3-12-2015.2262332>
53. Bodi M., Szopek M., Zahadat P., **Schmickl T. (2016)** Evolving Mixed Societies: A one-dimensional modelling approach In: Proceedings of the 9th EAI International Conference on Bio-inspired Information and Communications Technologies (*BICT 2015*) 3.-5. December 2015, New York City, USA. ISBN 978-1-63190-100-3. Published in EAI Endorsed Transactions on Serious Games 16(3): e5, DOI: 10.4108/eai.3-12-2015.2262514. ACM. Published in the *European Union Digital Library*.
54. Hahshold, S., Polder R., Radspieler G., Szopek M., **Schmickl T.**, Crailsheim K. (2016) Behaviour of single young honeybees and groups of young honeybees in a temperature gradient. In: EUROIUSSI (eds.) EUROIUSSI Abstract book. 2016. 56.a
55. Zahahdat P., Hahshold S., Thenius R., Crailsheim K., **Schmickl T. (2015)** From Honeybees to Robots and Back: Division of Labour based on Partitioning Social Inhibition. *Bioinspiration & Biomimetics* 10(6) (2015), DOI: 10.1088/1748-3190/10/6/066005

56. Zahadat P., **Schmickl T.** (2015) Evolving Controllers for Programmable Robots to Influence Non-Programmable Lifeforms: A Casy Study. In: *Lecture Notes in Computer Science* 9028: pp. 831-841.
57. Mills R., Zahadat P., Silva F., Mlikic D., Mariano P., **Schmickl T.**, Correia L. (2015) Coordination of collective behaviours in spatially separated agents. In: *Advances in Artificial Life*, ECAL 2015 (2015), pp. 579–586, MIT Press, DOI: <http://dx.doi.org/10.7551/978-0-262-33027-5-ch101>.
58. Hamann H., Whaby M., **Schmickl T.**, Zahadat P., Hofstadler D., Stoy K., Risi S., Faina A., Veenstra F., Kernbach S., Kuksin I., Kernbach O., Ayres P., Wojtaszek P. (2015) Flora robotica - Mixed Societies of Symbiotic Robot-PlantBio-Hybrids, to be published in Proc. of IEEE Symposium on Artificial Life (*IEEE ALIFE'15*), 2015.
59. Zahadat P., Hamann H., **Schmickl T.** (2015) Evolving Diverse Collective Behaviors Independent of Swarm Density. In: Proceedings of the *Workshop Evolving Collective Behaviors in Robotics, GECCO 2015*, Madrid, Spain, pp. 1245-1246, ACM 2015.
60. Zahadat P., Hamann H., **Schmickl T.** (2015) Evolving Collective Behaviors With Diverse But Predictable Sensor States. In: Proceedings of the *13th European Conference on Artificial Life (ECAL 2015)*, York, U.K., pp. 174, MIT Press.
61. **Schmickl T.**, Karsai I. (2014) Sting, carry and stock: How corpse availability can regulate de-centralized task allocation in a Ponerine ant colony. *PLoS ONE*, 9(12). Doi:10.1371/journal.pone.0114611
62. Salem Z., **Schmickl T.** (2014) The efficiency of the RULES-4 classification learning algorithm in predicting the density of agents. *Cogent Engineering*, 1:986262, doi.org/10.1080/23311916.2014.986262, 986262
63. Hamann H., **Schmickl T.**, Crailsheim K. (2014) Analysis of Swarm Behaviors Based on an Inversion of the Fluctuation Theorem. *Artificial Life* 20 (1), 77 - 93.
64. Kimura T., Ohashi M., Crailsheim K., **Schmickl T.**, Okada R., Radspieler G., Ikeno H. (2014) Development of a New Method to Track Multiple Honey Bees with Complex Behaviors on a Flat Laboratory Arena. *PLoS ONE*, 9 (1). doi.org/10.1371/journal.pone.0084656, e84656

65. Zahadat P., **Schmickl T. (2014)** Generation of Diversity in a Reaction-Diffusion-Based Controller. *Artificial Life* 20 (3), 319 - 342.
66. Zahadat P., **Schmickl T. (2014)** Wolfpack-inspired Evolutionary Algorithm and a Reaction-Diffusion-based Controller are used for Pattern Formation. Proceedings of Genetic and Evolutionary Computation Conference (**GECCO 2014**), pp. 241-248, ACM 2014.
67. Zahadat P., Bodi M., Salem Z., Bonnet F., de Oliveira M.E., Mondada F., Griparic K., Haus T., Bogdan S., Mills R., Mariano P., Correia L., Kernbach O., Kernbach S. and **Schmickl T. (2014)** Social Adaptation of Robots for Modulating Self-Organization in Animal Societies. In: *Proceedings of SASOW 2014, IEEE Conference on Self-Adaptive and Self-Organizing Systems Workshops (SASOW)*, pp. 55-60, doi:10.1109/SASOW.2014.13.
68. Szopek M., **Schmickl T.**, Thenius R., Radspieler G., Crailsheim K. (2013) Dynamics of Collective Decision Making of Honeybees in Complex Temperature Fields. *PloS ONE*, 8(11), doi.org/10.1371/journal.pone.0076250, e76250
69. Halloy J., Mondada F., Kernbach S., **Schmickl T. (2013)** Towards Bio-hybrid Systems Made of Social Animals and Robots In: N.F. Lepora, A. Mura, H. G. Krapp, P. F. M. J. Verschure and T. J. Prescott (eds.): Living Machines 2013, *Lecture Notes In Artificial Intelligence*, LNAI 8064, 384-386.
70. **Schmickl T.**, Bogdan S., Correia L., Kernbach S., Mondada F., Bodi M., Gribovskiy A., Hahshold H., Miklic D., Szopek M., Thenius R., Halloy J. (2013). ASSISI: Mixing Animals with Robots in a Hybrid Society. In: N.F. Lepora et al. (eds.) Living Machines 2013, *Lecture Notes In Artificial Intelligence*, LNAI 8064, 441-443.
71. **Schmickl T.**, Szopek M., Bodi M., Hahshold S., Radspieler G., Thenius R., Bogdan S., Miklic D., Kriparic K., Haus T., Kernbach S., Kernbach, O. (2013) ASSISI: Charged hot bees shakin' in the spotlight, In: Proceedings of the 17th IEEE International Conference on Self-Adaptive and Self-Organizing Systems, **SASO** 2013. ISBN 978-0-7695-5129-6. DOI: 10.1109/SASO.2013.26, 259-260
72. Stradner J. , Hamann H., Schwarzer Ch. S.F., Michiels N.K., **Schmickl T. (2013)** Virtual Spatiality in Agent Controllers: Encoding Compartmentalization. In: A.I. Esparcia-

- Alcázar et al. (eds.) EvoApplications 2013, *Lecture Notes in Computer Science*, LNCS 7835, pp. 579–588.
73. Read M., Möslinger Ch., Dipper T., Kengyel D., Hilder J., Thenius R., Tyrrell A., Timmis J., **Schmickl T. (2013)** Profiling Underwater Swarm Robotic Shoaling Performance using Simulation. In : A. Natraj, S. Cameron, C. Melhuhish, M. Witkovski (eds.) Proceedings of the **TAROS** 2013 conference.
74. Thenius R., Zahadat P., **Schmickl T. (2013)** EMANN - a model of emotions in an artificial neural network. In: Pietro Lió, Orazio Miglino, Giuseppe Nicosia, Stefano Nolfi, Mario Pavone (eds.) *Advances in Artificial Life*, Proceedings of the 12th European Conference on the Synthesis and Simulation of Living Systems, ECAL'13. 2nd-6th September 2013, Taormina, Italy. pp. 830-837.
75. Meister T., Thenius R., Kengyel D., **Schmickl T. (2013)** Cooperation of two different swarms controlled by BEECLUST algorithm. In: Pietro Lió, Orazio Miglino, Giuseppe Nicosia, Stefano Nolfi, Mario Pavone (eds.) *Advances in Artificial Life*, Proceedings of the 12th European Conference on the Synthesis and Simulation of Living Systems, ECAL'13. 2nd-6th September 2013, Taormina, Italy. pp. 1124-1125.
76. Kengyel D., Thenius R., Crailsheim K., **Schmickl T. (2013)** Influence of a Social Gradient on a Swarm of Agents Controlled by the BEECLUST Algorithm. In: Pietro Lió, Orazio Miglino, Giuseppe Nicosia, Stefano Nolfi, Mario Pavone (eds.) *Advances in Artificial Life*, Proceedings of the 12th European Conference on the Synthesis and Simulation of Living Systems, ECAL'13. 2nd-6th September 2013, Taormina, Italy. pp. 1041-1048.
77. Zahadat P., **Schmickl T.**, Crailsheim K. (2013) Evolution of Spatial Pattern Formation by Autonomous Bio-Inspired Cellular Controllers. In: Pietro Lió, Orazio Miglino, Giuseppe Nicosia, Stefano Nolfi, Mario Pavone (eds.) *Advances in Artificial Life*, Proceedings of the 12th European Conference on the Synthesis and Simulation of Living Systems, ECAL'13. 2nd-6th September 2013, Taormina, Italy. pp. 721-728.
78. Zahadat P., Crailsheim K., **Schmickl T. (2013)** Social Inhibition Manages Division of Labour in Artificial Swarm Systems. In: Pietro Lió, Orazio Miglino, Giuseppe Nicosia, Stefano Nolfi, Mario Pavone (eds.) *Advances in Artificial Life*, Proceedings of the 12th

- European Conference on the Synthesis and Simulation of Living Systems, ECAL'13. 2nd-6th September 2013, Taormina, Italy. pp. 609-616.
79. Scheiner R., Abramson CI., Brodschneider R., Crailsheim K., Farina W.M., Fuchs S., Grünewald B., Hahshold S., Karrer M., Koeniger G., Koeniger N., Menzel R., Mujagic S., Radspieler G., **Schmickl T.**, Schneider C., Siegel A.J., Szopek M., Thenius R. (2013) Standard methods for behavioral studies of *Apis mellifera*., ***Journal of Apicultural Research*** 52(4): 1-58. DOI 10.3896/IBRA.1.52.4.04. pp. 1-58
80. Hamann H., Karsai I., **Schmickl T.** (2013) Time Delay Implies Cost on Task Switching: A Model to Investigate the Efficiency of Task Partitioning. ***Bulletin of Mathematical Biology*** 75 (7), 1181-1206. DOI 10.1007/s11538-013-9851-4, pp. 1181-1206
81. Stradner J., Thenius R., Zahadat P., Hamann H., Crailsheim K., **Schmickl T.** (2013) Algorithmic Requirements for Swarm Intelligence in Differently Coupled Collective Systems. ***Chaos, Solitons & Fractals*** 50(100): 100-114.
82. Thenius R., Bodi M., **Schmickl T.**, Crailsheim K. (2013) Novel method of virtual embryogenesis for structuring Artificial Neural Network controllers. ***Mathematical and Computer Modelling of Dynamical Systems*** 19(4): 375-387. DOI: 10.1080/13873954.2012.756527
83. Kernbach S., Häbe D., Kernbach O., Thenius R., Radspieler G., Kimura T., **Schmickl T.** (2013) Adaptive collective decision-making in limited robot swarms without communication. ***The International Journal of Robotics Research*** 32 (1), 35-55.
84. Hamann H., **Schmickl T.**, Crailsheim K. (2012) A Hormone-Based Controller for Evaluation-Minimal Evolution in Decentrally Controlled Systems. ***Artificial Life*** 18(2), 165-198.
85. Hamann H., **Schmickl T.**, Wörn H., Crailsheim K. (2012) Analysis of Emergent Symmetry Breaking in Collective Decision Making. ***Neural Computing and Applications*** 21, 207-218. DOI 10.1007/s00521-010-0368-6.
86. **Schmickl T.**, Thenius R., Crailsheim K. (2012) Swarm-intelligent foraging in honeybees: benefits and costs of task-partitioning and environmental fluctuations. ***Neural Computing and Applications*** 21, 251-268. DOI 10.1007/s00521-010-0357-9.

87. Hamann H., **Schmickl T.**, Crailsheim K. (2012) Self-Organized pattern formation in a Swarm System as a Transient Phenomenon of Non-linear Dynamics. *Mathematical and Computer Modelling of Dynamical Systems* 18, 39-50. DOI: 10.1080/13873954.2011.601418.
88. Zahadat P., **Schmickl T.**, Crailsheim K. (2012) Evolving Reactive Controller for a Modular Robot: Benefits of the Property of State-Switching in Fractal Gene Regulatory Networks. In: "From Animals to Animats 12", *Lecture Notes in Computer Science* 7426, 209-218; DOI: 10.1007/978-3-642-33093-3_2
89. Hamann H., Stradner J., **Schmickl T.** (2012) Towards Morphological Flexibility: Modular Robotics and Bio-inspired Control. *Proceedings of the Austrian Robotics Workshop* (Operational Programme Slovenia-Austria), Graz, Austria, 2012.
90. Stradner J., Hamann H., Zahadat P., **Schmickl T.**, Crailsheim K. (2012) On-line, On-board Evolution of Reaction-Diffusion Control for Self-Adaptation. *Proceedings of the Alife XIII*, East Lansing, MI, USA, Christoph Adami, David M. Bryson, Charles Ofria, Robert T. Pennock (eds.), pp. 597-598, 2012.
91. Bodi M., Thenius R., **Schmickl T.**, Crailsheim K. (2012) Interaction of robot swarms using the honeybee inspired control algorithm BEECLUST. *Mathematical and Computer Modelling of Dynamical Systems* 18(1): 87-100. DOI: 10.1080/13873954.2011.601420.
92. Knisley J., **Schmickl T.**, Karsai I. (2011) Compartmental Models of Migratory Dynamics. *Mathematical Modelling of Natural Phenomena* 6, pp. 245-259
93. **Schmickl T.**, Hamann H., Crailsheim K. (2011) Modelling a hormone-inspired controller for individual- and multi-modular robotic systems. *Mathematical and Computer Modelling of Dynamical Systems* 17, No. 3, 221-242. DOI: 10.1080/13873954.2011.557862
94. Hamann H., **Schmickl T.**, Crailsheim K. (2011) Explaining Emergent Behavior in a Swarm System Based on an Inversion of the Fluctuation Theorem. In: T. Lenaerts, M. Giacobini, H. Bersini, P. Bourguine, M. Dorigo, R. Doursat (eds.) "Advances in Artificial Life, ECAL 2011: Proceedings of the 11th European Conference on the Synthesis and Simulation of Living Systems. MIT Press pp. 302-309

95. **Schmickl T.**, Stradner J., Hamann H., Winkler L., Crailsheim K. (2011) Major feedbacks that support artificial evolution in multi-modular robotics. *Studies in Computational Intelligence* 341, pp. 195-209
96. **Schmickl T.**, Karsai I. (2011) Regulation of task partitioning by a “common stomach”: a model of nest construction in social wasps. *Behavioral Ecology* 22 (4): 819-830. DOI: 10.1093/beheco/arr060, pp. 819-830
97. Hamann H., **Schmickl T.**, Crailsheim K. (2011) Coupled Inverted Pendulums: A Benchmark for Evolving Decentral Controllers in Modular Robotics. In: N. Krasnogor (eds.) Proceedings of the 13th annual conference on Genetic and evolutionary computation (*GECCO 2011*). (ACM 978-1-4503-0557-0/11/07), pp. 195-202
98. Bodi M., Thenius R., **Schmickl T.**, Crailsheim K. (2011) How two cooperating robot swarms are affected by two conflictive aggregation spots. In: G. Kampis, I. Karsai, E. Szathmáry (eds.) “Advances in Artificial life – Part II”, *Lecture Notes in Computer Science* 5778, ISBN 978-3-642-21313-7, pp. 367-374
99. Hamann H., **Schmickl T.**, Crailsheim K. (2011) Evolving for Creativity: Maximizing Complexity in a Self-Organized Multi-Particle System. In: G. Kampis, I. Karsai, E. Szathmáry (eds.) “Advances in Artificial life – Part I”, *Lecture Notes in Computer Science* 5777, ISBN 978-3-642-21282-6, pp. 442-349
100. Kengyel D., Schmickl T., Hamann H., Thenius R., Crailsheim K. (2011) Embodiment of Honeybee's Thermotaxis in a Mobile Robot Swarm. In: G. Kampis, I. Karsai, E. Szathmáry (eds.) “Advances in Artificial life – Part II”, *Lecture Notes in Computer Science* 5778, ISBN 978-3-642-21313-7, pp. 69-76
101. Möslinger Ch., **Schmickl T.**, Crailsheim K. (2011) A Minimalist Flocking Algorithm for Swarm Robots. In: G. Kampis, I. Karsai, E. Szathmáry (eds.) “Advances in Artificial life – Part II”, *Lecture Notes in Computer Science* 5778, ISBN 978-3-642-21313-7, pp. 375-382
102. Thenius R., Bodi M., **Schmickl T.**, Crailsheim K. (2011) Growth of Structured Artificial Neural Networks by Virtual Embryogenesis. In: G. Kampis, I. Karsai, E. Szathmáry (eds.) “Advances in Artificial life – Part II”, *Lecture Notes in Computer Science* 5778, ISBN 978-3-642-21313-7, pp. 118-125

103. **Schmickl T.**, Crailsheim K. (2011) Economics of Specialization in Honeybees. A multi-agent simulation study of honeybees. In: G. Kampis, I. Karsai, E. Szathmary (eds.) “Advances in Artificial life – Part II”, *Lecture Notes in Computer Science* 5778, ISBN 978-3-642-21313-7, pp. 358-366
104. Stradner J., Hamann H., **Schmickl T.**, Thenius R., Crailsheim K. (2011): Evolving a novel bio-inspired controller in reconfigurable robots. In: G. Kampis, I. Karsai, E. Szathmary (eds.) “Advances in Artificial life – Part I”, *Lecture Notes in Computer Science* 5777, ISBN 978-3-642-21282-6, pp. 132-139
105. **Schmickl T.**, Thenius R., Stradner J., Hamann H., Crailsheim K. (2011) Robotic Organisms - Artificial Homeostatic Hormone System and Virtual Embryogenesis as Examples for Adaptive Reaction-Diffusion Controllers. In: IROS 2011 Workshop–Reconfigurable Modular Robotics: Challenges of Mechatronic and Bio-Chemo-Hybrid Systems. (IROS 2011), organized by Serge Kernbach, Robert Charles Fitch.
106. Hamann H., **Schmickl T.**, Crailsheim K. (2011) Thermodynamics of Emergence: Langton's Ant Meets Boltzmann. In: IEEE (eds.) Proceedings of the IEEE Symposium on Artificial Life (2011), pp. 62-69.
107. Thenius R., Dauschan M., **Schmickl T.**, Crailsheim K. (2011) Regenerative abilities in modular robots using virtual embryogenesis. In: A. Bouchachia (eds.) *Proceedings of the International Conference on Adaptive and Intelligent Systems 2011 (ICAIS'11)*, 227-237.
108. Dauschan M., Thenius R., **Schmickl T.**, Crailsheim K. (2011) Using virtual embryogenesis in multi-robot organisms. In: A. Bouchachia (eds.) *Proceedings of the International Conference on Adaptive and Intelligent Systems 2011 (ICAIS'11)*, 238-247.
109. **Schmickl T.**, Thenius R., Moslinger Ch., Halloy J., Campo A., Kernbach S., Dipper T., Sutantyo D., Timmis J., Tyrrell A., Read M., Hilder J., Stefanini C., Manfredi L., Orofino S. (2011) CoCoRo - The Self-aware Underwater Swarm. In: IEEE (eds.) Proceedings of the 5th IEEE International Conference on Self-Adaptive and Self-Organizing Systems (SASO 2011) 1st Awareness workshop, organized by Emma Hart and Jennifer Willies. DOI: 10.1109/SASOW.2011.11

110. Thenius R., Bodi M., **Schmickl T.**, Crailsheim K. (2010) Using Virtual Embryogenesis for Structuring Controllers. In: E. Hart et al. (eds.) In: E. Hart, C. McEwan, J. Timmis, A. Hone (eds.) Proceedings of the 9th International Conference (ICARIS 2010) *Lecture Notes in Computer Science* 6209, 312–313.
111. Hamann H., Stradner J., **Schmickl T.**, Crailsheim K. (2010) Artificial Hormone Reaction Networks: Towards Higher Evolvability in Evolutionary Multi-Modular Robotics. In: Alife (eds.) Proceedings of the 12th International Conference on Artificial Life (*ALife XII*), 773-780.
112. **Schmickl T.**, Hamann H., Stradner J., Mayet R., Crailsheim K. (2010) Complex Taxis-Behaviour in a Novel Bio-Inspired Robot Controller. In: Alife (eds.) Proceedings of the 12th International Conference on Artificial Life (*ALife XII*), 648-655.
113. Kernbach S., **Schmickl T.**, Hamann H., Stradner J., Schwarzer Ch., Schlachter F., Winfield A.F.T., Matthias R. (2010) Adaptive Action Selection Mechanisms for Evolutionary Multimodular Robotics. In: Alife (eds.) Proceedings of the 12th International Conference on Artificial Life (*ALife XII*), 781-788.
114. Mayet R., Roberz J., **Schmickl T.**, Crailsheim K. (2011) Antbots: A feasible visual emulation of pheromone trails for swarm robots. In: M. Dorigo, M. Birattari, G. A. Di Caro, René Doursat, A. P. Engelbrecht, D. Floreano, L. M. Gambardella, R. Groß, E. Şahin, H. Sayama, T. Stützle (eds.) Proceedings of the 7th International Conference. *Lecture Notes in Computer Science (LNCS)* 6234, 84-94.
115. Möslinger Ch., **Schmickl T.**, Crailsheim K. (2010) Emergent Flocking with Low-End Swarm Robots. In: Editors (eds.) Proceedings of the 7th International Conference. *Lecture Notes in Computer Science (LNCS)* 6234, 424-431.
116. Hamann H., Meyer B., **Schmickl T.**, Crailsheim K. (2010) A Model of Symmetry Breaking in Collective Decisions. In: S. Doncieux and B. Girard and A. Guillot and J. Hallam and J.A. Meyer and J.B. Mouret (eds.) From Animals to Animats XI: Simulation of Adaptive Behavior (SAB'10). *Lecture Notes in Artificial Intelligence (LNAI)* 6226, 639-648.
117. **Schmickl T.** (2010). Bio-Inspiration and Artificial Evolution in Collective Robotics. In: IEEE (eds.) Proceedings of the IEEE International Conference on Robotics and

- Automation, Anchorage, Alaska, May 3-8, 2010, Workshop on Bio-Inspired Self-Organizing Robotic Systems (*ICRA'2010*).
118. Hamann H., Stradner J., **Schmickl T.**, Crailsheim K. (2010) A Hormone-Based Controller for Evolutionary Multi-Modular Robotics: From Single Modules to Gait Learning. In: IEEE (eds.) Proceedings of the IEEE Congress on Evolutionary Computation *CEC'10*, 244 - 251.
 119. **Schmickl T.**, Karsai I. (2010) The interplay of sex ratio, male success and density-independent mortality affects population dynamics. *Ecological Modelling* 221, 1089–1097.
 120. **Schmickl T.**, Hamann H., Crailsheim K., Wörn H. (2009) Two Different Approaches to a Macroscopic Model of a Bio-Inspired Robotic Swarm. *Robotics and Autonomous Systems* 57: 913 - 921.
 121. Kernbach S., Thenius R., Kernbach O., **Schmickl T.** (2009) Re-embodiment of Honeybee Aggregation Behavior in an Artificial Micro-Robotic System. *Adaptive Behavior* 17(3): 237-256.
 122. Corradi P., **Schmickl T.**, Scholz O., Menciassi A., Dario P. (2009) Optical Networking in a Swarm of Microrobots. In: M. Cheng (eds.) Proceedings of the 3rd International ICST Conference NanoNet *Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering* 3(2): 107 - 119.
 123. Stradner J., Hamann H., **Schmickl T.**, Crailsheim K. (2009) Analysis and Implementation of an Artificial Homeostatic Hormone System: A First Case Study in Robotic Hardware. In: IEEE (eds.) Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (*IROS'09*), St. Louis, MO, USA, October 11-15, 2009
 124. Kernbach S., Hamann H., Stradner J., Thenius R., **Schmickl T.**, van Rossum A.C., Sebag M., Bredeche N., Yao Y., Baele G., Van de Peer Y., Timmis J., Mohktark M., Tyrrell A., Eiben A.E., McKibbin S.P., Liu W., Winfield A.F.T. (2009) On adaptive self-organization in artificial robot organisms. In: Editors (eds.) Proceedings of the First International Conference on Adaptive and Self-adaptive Systems and Applications (*ADAPTIVE* 2009), Athens/Glyfada, Greece

125. Baele G., Bredeche N., Haasdijk E., Maere S., Michiels N., Van de Peer Y., **Schmickl T.**, Schwarzer Ch., Thenius, R. (2009) Open-ended On-board Evolutionary Robotics for Robot Swarms. In: IEEE (eds.) Proceedings of the IEEE Congress on Evolutionary Computation (*CEC'09*) Trondheim, Norway, 18th -21st of May, 2009, DOI: 10.1109/CEC.2009.4983072
126. Szymanski M., Winkler L., Laneri D., Schlachter F., van Rossum A.C., **Schmickl T.**, Thenius R. (2009) SymbricatorRTOS: A Flexible and Dynamic Framework for Bio-Inspired Robot Control Systems and Evolution. In: IEEE (eds.) Proceedings of the IEEE Congress on Evolutionary Computation (*CEC'09*) Trondheim, Norway, 18th -21st of May, 2009. pp. 3314-3031
127. **Schmickl T.**, Crailsheim K. (2009) Modelling a hormone-based robot controller. In: *ARGESIM Report* 35, 1754 - 1764. In: Mathmod Full Papers CD Volume, I. Troch, F. Breitenecker (eds.) Proceedings MATHMOD 09 Vienna - Full Papers CD Volume, I. Troch, F. Breitenecker, eds., ISBN 978-3-901608-35-3
128. Thenius R., **Schmickl T.**, Crailsheim K. (2009) Novel concept of modelling embryology for structuring an artificial neural network. In: Mathmod Full Papers CD Volume, I. Troch, F. Breitenecker (eds.) *ARGESIM Report* 35, 1821 - 1828. Proceedings MATHMOD 09 Vienna., ISBN 978-3-901608-35-3
129. Radspieler G., Thenius R., **Schmickl T.** (2009) Individual-based modelling of temperature-induced aggregation behaviour. In: Mathmod Full Papers CD Volume, I. Troch, F. Breitenecker (eds.) *ARGESIM Report* 35, 895 - 903. Proceedings MATHMOD 09 Vienna - Full Papers CD Volume, ISBN 978-3-901608-35-3
130. Bodi M., Thenius R., **Schmickl T.**, Crailsheim K. (2009) Robustness of two interacting robot swarms using the BEECLUST algorithm. In: Mathmod Full Papers CD Volume, I. Troch, F. Breitenecker (eds.) *ARGESIM Report* 35, 904 - 912. Proceedings MATHMOD 09 Vienna - Full Papers CD Volume, ISBN 978-3-901608-35-3
131. **Schmickl T.**, Crailsheim K. (2008) Analysing honeybees' division of labour in broodcare by a multi-agent model. In: Bullock, S., Noble, J., Watson, R., Bedau, M. A. (eds.) *Artificial Life XI*: Proceedings of the Eleventh International Conference on the Simulation and Synthesis of Living Systems. MIT Press, Cambridge, MA: 529-536.

132. Kernbach S., Meister E., Schlachter F., Jebens K., Szymanski M., Liedke J., Laneri D., Winkler L., **Schmickl T.**, Thenius R., Corradi P., Ricotti L. (2008) Symbiotic Robot Organisms: Replicator and Symbion Projects. In: PerMIS (eds.) Symbiotic Robot Organisms: Replicator and Symbion Projects. Proceedings of the *PerMIS 08*, August 19-21, 2008, Gaithersburg, MD, USA pp. 62-69
133. Hamann H., Wörn H., Crailsheim K., **Schmickl T.** (2008) Spatial Macroscopic Models of a Bio-Inspired Robotic Swarm Algorithm. In: IEEE (eds.) Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems, *IROS'08*, Nice, 2008. pp. 1415-1420
134. **Schmickl T.**, Crailsheim K. (2008) An individual-based model of task selection in honeybees. In: M. Asada, J. C. T. Hallam, J.-A. Meyer, J. Tani (eds.) Proceedings of the 10th International Conference on Simulation of Adaptive Behavior (SAB 2008). *Lecture Notes in Computer Science* 5040: 383-392.
135. Thenius R., **Schmickl T.**, Crailsheim K. (2008) Optimisation of a honeybee-colony's energetics via social learning based on queuing delays. *Connection Science* 20 (2-3): 193-210.
136. **Schmickl T.**, Thenius R., Möslinger Ch., Radspieler G., Kernbach S., Szymanski M., Crailsheim K. (2008) Get in touch: cooperative decision making based on robot-to-robot collisions. *Autonomous Agents and Multi-Agent Systems* 18(1): 133-155.
137. **Schmickl T.**, Crailsheim K. (2008) Trophallaxis within a robot swarm: Bio-inspired communication among robots in a swarm. *Autonomous Robots* 25: 171-188.
138. **Schmickl T.**, Crailsheim K. (2008) TaskSelSim: A Model of the Self-Organisation of the Division of Labour of Honeybees. *Mathematical and Computer Modelling of Dynamical Systems* 14: 101 – 125.
139. **Schmickl T.**, Möslinger Ch., Thenius R., Crailsheim K. (2007) Individual adaptation allows collective path-finding in a robotic swarm. *International Journal of Factory Automation, Robotics and Soft Computing* 4: 102 – 108.
140. **Schmickl T.**, Möslinger C., Thenius R., Crailsheim K. (2007) Bio-inspired Navigation of Autonomous Robots in Heterogenous Environments. *International Journal of Factory Automation, Robotics and Soft Computing* 3: 164 – 170. ISSN 1828-6984.

141. **Schmickl T.**, Crailsheim K. (2007) HoPoMo: A model of honeybee intracolony population dynamics and resource management. *Ecological Modelling* 204: 219 – 245.
142. **Schmickl T.**, Crailsheim K. (2007) A Navigation Algorithm for Swarm Robotics Inspired by Slime Mold Aggregation. In: Sahin E., Spears W.M., Winfield A.F.T. (eds.). *Swarm Robotics; Second SAB 2006 International Workshop. Lecture Notes in Computer Science* 4433: 1 – 13.
143. **Schmickl T.**, Möslinger, C., Crailsheim K. (2007) Collective perception in a robot swarm. In: Sahin E., Spears W.M., Winfield A.F.T. (eds.). *Swarm Robotics; Second SAB 2006 International Workshop. Lecture Notes in Computer Science* 4433: 144 – 157.
144. Valdastrì P., Corradi P., Menciassi A., **Schmickl T.**, Crailsheim K., Seyfried S., Dario P. (2006) Micromanipulation, Communication and Swarm Intelligence Issues in a Swarm Microrobotic Platform. *Robotics and Autonomous Systems* 54: 789-804.
145. **Schmickl T.**, Crailsheim K. (2006) Bubbleworld.evo: Artificial evolution of behavioral decisions in a simulated predator-prey ecosystem. In: Nolfi, S., Baldassarre, G., Calabretta, R., Hallam, J.C.T., Marocco, D., Meyer, J.-A., Miglino, O., Parisi, D. (eds.) *From Animal to Animats 9 (SAB 2006), Lecture Notes in Artificial Intelligence* 4095, pp. 594-605, Springer Verlag Berlin Heidelberg.
146. Thenius R., **Schmickl T.**, Crailsheim K. (2006) Economic optimisation in honeybees: adaptive behaviour of a superorganism. In: Nolfi, S., Baldassarre, G., Calabretta, R., Hallam, J.C.T., Marocco, D., Meyer, J.-A., Miglino, O., Parisi, D. (eds.) *From Animal to Animats 9 (SAB 2006), Lecture Notes in Artificial Intelligence* 4095, pp. 725-737, Springer Verlag Berlin Heidelberg.
147. **Schmickl T.**, Crailsheim K. (2006) Trophallaxis among swarm-robots: A biologically inspired strategy for swarm robotics. In: IEEE (eds.) *Proceedings of the 1st IEE/RAS-EMBS International Conference on Biomedical Robotics and Biomechanotronics (BIOROB 2006)*. 20.2.-22.2.2006, Pisa, Italy. ISBN 1-4244-0040-6, IEEE-Catalog-No: 06EX1254D.
148. **Schmickl T.**, Crailsheim K. (2006) Modelling the self-organized division of labour in honeybees. In: Mathmod (eds.) *Proceedings of the 5th Vienna Symposium on*

- Mathematical Modelling (MATHMOD), 8.2.-10.2.2006, Vienna. *ARGESIM Report* Nr. 30, eds. I.Troch, F.Breitenecker. ISBN 3-901608-3.
149. Thenius R., **Schmickl T.**, Crailsheim K. (2006) Modelling nectar-collecting behaviour in a honeybee colony. In: Mathmod (eds.) Proceedings of the 5th Vienna Symposium on Mathematical Modelling (MATHMOD), 8.2.-10.2.2006, Vienna. *ARGESIM Report* Nr. 30, eds. I.Troch, F.Breitenecker. ISBN 3-901608-3.
150. Thenius R., **Schmickl T.**, Crailsheim K. (2005) The “Dance or Work” Problem: Why Do not all Honeybees Dance with Maximum Intensity. In: M. Pechoucek, P. Petta, and L.Z. Varga (eds.) Proceedings of the 4th International Central and Eastern European Conference on Multi-Agent Systems, (CEEMAS 2005) *Lecture Notes in Artificial Intelligence* (LNAI) 3690, pp. 246–255, 2005. Springer-Verlag Berlin Heidelberg.
151. **Schmickl T.**, Thenius R., Crailsheim K. (2005) Simulating Swarm Intelligence in Honey Bees: Foraging in Differently Fluctuating Environments In: GECCO (eds.) Proceedings of the Genetic and Evolutionary Computation Conference (*GECCO 2005*), June 25-29, 2005, Washington, DC, USA. (ACM 1-59593-010-8/05/0006). pp. 273-274
152. **Schmickl T.**, Crailsheim K. (2004) Costs of environmental fluctuations and benefits of dynamic decentralized foraging decisions in honey bees. *Adaptive Behavior* 12: 263-277.
153. **Schmickl T.**, Crailsheim K. (2004) Inner nest homeostasis in a changing environment with special emphasis on honeybee brood nursing and pollen supply. *Apidologie* 35: 249-263.
154. **Schmickl T.**, Crailsheim K. (2003) Costs of environmental fluctuations and benefits of dynamic decentralized foraging decisions in honey bees. In: MASI (eds.) Proceedings of the 2nd International Workshop on the Mathematics and Algorithms of Social Insects (*MASI 2003*), Georgia Institute of Technology, Atlanta, GA 30332, December 15-17, 2003. pp. 145-152
155. **Schmickl T.**, Crailsheim K. (2003) A honeybee population model with special emphasis on resource management and division of labor. In: IMACS (eds.) Proceedings of the 4th IMACS Symposium on Mathematical Modelling, Feb. 5-7, 2003, Vienna, Austria, *ARGESIM Report* No. 24, ISBN 3-901608-24-9.

156. **Schmickl T.**, Blaschon B., Gurmman B., Crailsheim K. (2003) Collective and individual nursing investment in the queen and in young and old honeybee larvae during foraging and non-foraging periods. *Insectes Sociaux* 50: 174–184.
157. **Schmickl T.**, Crailsheim K. (2002) How honeybees (*Apis mellifera* L.) change their broodcare behavior in response to non-foraging conditions and poor pollen conditions. *Behavioral Ecology Sociobiology* 51: 415–425.
158. **Schmickl T.**, Crailsheim K. (2001) Cannibalism and early capping: Strategy of honeybee colonies in times of experimental pollen shortages. *Journal of Comparative Physiology* 187: 541–547.
159. Möse J.R., Miorini T., **Schmickl T.** (1994) Zur Problematik der Schimmelpilz-Sporenkonzentration in der Luft von Krankenhäusern. *Krankenhaus-Hygiene und Infektionsverhütung* 16: 162-167. ("The problem of mould spores in the air of hospitals").

Scientific preprint papers

1. **Schmickl T.**, Stefanec M. (2019) A Primordial Particle System in three dimensions. <https://arxiv.org/abs/1901.09293>
2. Hornischer H., Varughese J.C., Thenius R., Wotawa F., Füllsack M., **Schmickl T.** (2019) CIMAX: Collective Information Maximization in Robotic Swarms Using Local Communication. <https://arxiv.org/abs/1903.05444>

Short workshop papers:

1. **Schmickl T.**, Thenius R., Timmis J., Tyrrell A., Halloy J., Stefanini C., Manfredi L., Campo A., Sutantyo D., Kernbach S. (2011) CoCoRo: A swarm of self-aware underwater robots. In: IEEE (eds.) Proceedings of the 5th IEEE Conference (ICAR 2011) – workshop “underwater robotics”, organized by Maarja Kruusmaa, Giovanni Indiveri and Gianluca Antonelli, DOI: 10.1109/SASOW.2011.11
2. **Schmickl T.**, Thenius R., Timmis J., Tyrrell A., Halloy J., Stefanini C., Manfredi L., Campo A., Sutantyo D., Kernbach S. (2011) CoCoRo: The self-aware swarm of underwater robots. In: IEEE (eds.) Proceedings of the 5th IEEE Conference (IROS 2011) - IEEE/RSJ International Conference on Intelligent Robots and Systems.

Workshop “Redundancy in Robot Manipulators and Multi-Robot Systems”, organized by Dejan Milutinovic, Jacob Rosen.

Articles in books and book chapters:

1. **Schmickl, T.**, Müggenburg, J., Warnke, M. (2018) Perverse Bienen. Artificial Life und der Apfel der Erkenntnis. Zeitschrift für Medienwissenschaft, 10 (1), 98-110.
2. Scheiner R., Abramson C.I., Brodschneider R., Crailsheim K., Farina W., Fuchs S., Grünewald B., Hahshold S., Karrer M., Koeniger G., Koeniger N., Menzel R., Mujagic S., Radspieler G., **Schmickl T.**, Schneider C., Siegel A.J., Szopek M., Thenius R. (2013) Standard methods for behavioural studies of *Apis mellifera*. In: V Dietemann; J D Ellis; P Neumann (eds.) The COLOSS BEEBOOK, Volume I: standard methods for *Apis mellifera* research. Journal of Apicultural Research 52(4). DOI: 10.3896/IBRA.1.52.4.04
3. **Schmickl T.**, Crailsheim K., Deneubourg J.-L., Halloy J. (2013) Bio-mimetic and bio-inspired design of collective systems. In: S. Kernbach, P. Levy (eds.) Handbook of Collective Robotics: Fundamentals and Challenges, Springer.
4. Winfield A.F.T., Kernbach S., **Schmickl T.** (2013) Collective foraging: Cleaning, energy harvesting and trophallaxis. In: S. Kernbach, P. Levy (eds.) Handbook of Collective Robotics: Fundamentals and Challenges, Springer.
5. **Schmickl T.**, Crailsheim K. (2012) Modelling Population dynamics, division of labour and nutrient economics of social insect colonies. In: **Ecological Modeling**. Wen-Jun Zhang (eds.). Nova Science Publishers, Inc., NY, USA. Pp. 223-265. ISBN: 978-1-61324-567-5.
6. **Schmickl T.** (2011) How to engineer robotic organisms and swarms? Bio-inspiration, bio-mimicry, and artificial evolution in embodied self-organized systems. In: Yan Meng and Yaochu Jin (eds.) Bio-Inspired Self-Organizing Robotic Systems. **Studies in Computational Intelligence** Volume 355, 2011, DOI: 10.1007/978-3-642-20760-0. pp. 25-52.
7. **Schmickl T.**, Hamann H. (2011) BEECLUST: A Swarm Algorithm Derived from Honeybees. Derivation of the Algorithm, Analysis by Mathematical Models and

- Implementation on a Robot Swarm. In: Yang Xiao, Dr. Fei Hu (eds.), *Bio-inspired Computing and Communication Networks*, Auerbach Publications, CRC Press. pp. 95-138.
8. **Schmickl T.**, Hamann H., Stradner J., Crailsheim K. (2010): Hormone-based Control for Multi-modular Robotics. In: P. Levi and S. Kernbach (eds.): *Symbiotic Multi-Robot Organisms: Reliability, Adaptability, Evolution*. Springer.
 9. Thenius R., Bodi M., **Schmickl T.**, Crailsheim K. (2010): Evolving Artificial Neural Networks and Artificial Embryology. In: P. Levi, S. Kernbach (Eds.) *Symbiotic Multi-Robot Organisms: Reliability, Adaptability, Evolution*. Springer.
 10. **Schmickl T.** (2009) Schwarmintelligenz am Beispiel der Ameisenstraßen. In: **Denisia 25:** „Geschätzt, verflucht, allgegenwärtig Ameisen in Biologie und Volkskultur“. pp. 188. ISSN: 1608-8700.
 11. **Schmickl T.**, Möslinger Ch., Thenius R., Crailsheim K. (2008) Individual adaptation allows collective path-finding in a robotic swarm. In: S. Pennachio (eds.) *Recent advances in Control Systems, Robotics and Automation*, ISBN: 978-88-901928-3-8, International Society for Advanced Research, www.internationalsar.org. pp. 217 – 222.
 12. **Schmickl T.**, Möslinger C., Thenius R., Crailsheim K. (2007) Bio-inspired Navigation of Autonomous Robots in Heterogenous Environments. In: S. Pennachio (eds.) *Emerging Technologies, Robotics and Control Systems*, Vol. 2, International Society for Advanced Research, www.internationalsar.org. pp. 126 – 132.
 13. **Schmickl T.** (2003) Sammeln, Verteilen und Bewerten von Informationen: Verteilte Intelligenz in einem Bienenvolk. In: *FACTS 1: Die Informationsgesellschaft* (eds. Gesellschaft zur Durchführung von Fachhochschulstudiengängen St. Pölten), Böhlau Verlag, Wien, Köln, Weimar. ISBN 3-205-77183-4. pp. 103–120. ("Collecting, distributing and assessment of information: distributed intelligence in a honeybee colony").

Articles in popular scientific journals:

1. Zahadat P., **Schmickl T.** (2016) Division of Labor in a Swarm of Autonomous Underwater Robots by Improved Partitioning Social Inhibition. *Adaptive Behavior* 24(2), 87-101
2. Radspieler G., Thenius R., Szopek M., Hahshold S., **Schmickl T.**, Crailsheim K. (2012) Vibration als Ersatz für soziale Stimuli bei jungen Honigbienen. *Entomologica Austriaca* 19, 66-68.
3. **Schmickl T.**, Möslinger Ch., Thenius R. (2011) A self-aware swarm of underwater vehicles. *AWARENESS magazine*. DOI 10.2417/3201111.003880.
4. Thenius R., Bodi M., **Schmickl T.**, Crailsheim K. (2010) Evolving virtual embryogenesis to structure complex controllers. *PerAda magazine*, DOI 10.2417/2201009.003291, 368–371
5. Hahshold S., Radspieler G., Szopek M., Thenius R., **Schmickl T.**, Crailsheim K. (2010) Robuste Gruppenentscheidungen bei Honigbienen, in: *Entomologica Austriaca* 17, 125 - 126.
6. **Schmickl T.**, Thenius R. Möslinger Ch., Crailsheim K. (2009) Bio-Inspiration als Weg zu intelligenten Roboterschwärmen. *Entomologica Austriaca* 16, 154-155.
7. Szopek M., Radspieler G., Thenius R., **Schmickl T.**, Crailsheim K. (2009). Verhalten junger Honigbienen in zweidimensionalen Temperaturgradienten. *Entomologica Austriaca* 16, 151-152.
8. **Schmickl T.**, Thenius R., Crailsheim K. (2006) Kollektive Sammelentscheidungen: eine Multi-Agenten-Simulation einer Honigbienenkolonie. *Entomologica Austriaca* 13, 15-24. ISSN 1681-0406.
9. Thenius R., **Schmickl T.**, Crailsheim K. (2006) Einfluß der Individualität bei Sammelbienen (*Apis mellifera* L) auf den Sammelerfolg. *Entomologica Austriaca* 13, 25-29. ISSN 1681-0406.
10. **Schmickl T.** (2005) Mathematische Modellierung der Populationsdynamik eines Bienenvolkes. *Entomologica Austriaca* 12, 6-12, ISSN 1681-0406.

11. Crailsheim K., Thenius R., **Schmickl T. (2004)** Ottimizzazione della raccolta del nettare nelle api. *APOidea* 1: 5-11. ISSN 1724-8167. ("Optimisation of nectar foraging in honeybees").
12. Crailsheim K., **Schmickl T. (2002)** Was fressen Bienen bei schlechtem Wetter? *Deutsches Bienen Journal* 7: 4-6. ISSN 0943-2914. ("What do honeybees eat in times of bad weather?").
13. **Schmickl T.**, Crailsheim K. (2001) Brutkannibalismus bei Honigbienen (*Apis mellifera carnica*) - Wie Honigbienen die Größe ihres Brutnestes bei längeren Schlechtwetterperioden regulieren. *Entomologica Austriaca* 2, 10-11.

Invited papers, position papers, editorials:

1. **Schmickl T. (2011)** Unmasking 5 common rumors on artificial collective adaptive systems. Position paper at: Consultation workshop "living technology / artificial systems / embodied evolution", 10th Nov. in Brussels (FET Proactive).
2. Halloy J., Kernbach S., **Schmickl T. (2011)** Towards mixed societies of animals and robots. Position paper at: Consultation workshop "living technology / artificial systems / embodied evolution", 10th Nov. in Brussels (FET Proactive).
3. Hamann H., **Schmickl T. (2011)** Modelling the swarm: Analysing biological and engineered swarm systems. Editorial of the special issue "Modelling the Swarm" in *Mathematical and Computer Modelling of Dynamical Systems*, 2011, Taylor & Francis. DOI: 10.1080/13873954.2011.601426.
4. Kernbach S., **Schmickl T.**, Timmis J. (2009) Collective Adaptive Systems: Challenges Beyond Evolvability. Position paper at the FET external consultation "Fundamentals of collective adaptive systems", Brussels, 3rd-4th Nov. 2009.
5. **Schmickl T.**, Kernbach S. (2009): Creating adaptive systems that are as "rich" as their natural counterparts? Challenges for Evolvability. Position paper at the FET external consultation "Fundamentals of collective adaptive systems", Brussels, 3rd-4th Nov. 2009.

Abstracts, short papers and letters in peer-reviewed journals:

1. Zahadat P., Hamann H., **Schmickl T. (2015)** Evolving Diverse Collective Behaviors Independent of Swarm Density, In: Companion Publication of the 2015 Annual Conference on Genetic and Evolutionary Computation (GECCO Companion '15), GECCO 2015, Sara Silva (Ed.). ACM, New York, NY, USA, 1245-1246.
2. Zahadat P., Hamann H., **Schmickl T. (2015)**: Evolving Collective Behaviors With Diverse But Predictable Sensor States. Proceedings of the 13th European conference on Artificial Life (ECAL 2015), York, UK, 2015 (2015)
3. Szopek M., Hahshold S., Thenius R., Bodi M., Crailsheim K., **Schmickl T. (2014)** ASSISIBf: Honeybees and robots form a bio-hybrid society. *Entomologica Austriaca* 21, 242-243.
4. Szopek M., Hahshold S., Thenius R., **Schmickl T.**, Crailsheim K., **(2012)** How social cues influence collective decisions in honeybees. *Apidologie* 42, 786-787.
5. Hahshold S., Radspieler G., Thenius R., **Schmickl T.**, Crailsheim K. **(2010)** Cooperative thermotaxis in honeybees: social gradient vs. temperature gradient. *Apidologie* 41, 686-687.
6. Szopek M., Radspieler G., Thenius R., **Schmickl T.**, Crailsheim K. **(2010)** Cooperative thermotaxis in honeybees: flexible group behaviour in a dynamic environment. *Apidologie* 41, pp. 687.
7. Radspieler G., Szopek M., Hahshold S., Thenius R., **Schmickl T.**, Crailsheim K. **(2010)** Analysis of honeybee locomotion behaviour. *Apidologie* 41, pp. 686.
8. Szopek M., Radspieler G., Thenius R., **Schmickl T.**, Crailsheim K. **(2009)** Cooperative thermotaxis in honeybees: Group decisions in a complex temperature gradient. *Apidologie* 40, pp. 663
9. Szopek M., Radspieler G., Thenius R., **Schmickl T.**, Crailsheim K. **(2009)**. Verhalten junger Honigbienen in zweidimensionalen Temperaturgradienten. *Entomologica Austriaca* 16 , 154-155

10. Hahshold S., Radspieler G., Thenius R., **Schmickl T.**, Crailsheim K. (2009) Cooperative thermotaxis in honeybees: How robust are group decisions? *Apidologie* 40, pp. 51 - 670
11. Vollmann J., Thenius R., **Schmickl T.**, Crailsheim K. (2009) Contact-free age determination of honeybee larvae (*Apis mellifera*). *Apidologie* 40, pp. 662
12. Thenius, R., **Schmickl, T.**, Crailsheim, K. (2008) How to know without having been there? Investigating communication channels in the nectar collecting system of a honeybee colony. In: Bullock, S., Noble, J., Watson, R., Bedau, M. A. (eds.) **Artificial Life XI: Proceedings of the Eleventh International Conference on the Simulation and Synthesis of Living Systems**. MIT Press, Cambridge, MA: pp.807
13. Vollmann J., **Schmickl T.**, Crailsheim K. (2004) The reaction of honeybee colonies to different quantities of brood. *Apidologie* 35: 546-547.
14. Thenius R., **Schmickl T.**, Crailsheim K. (2004) Multi-factoral simulation of the nectar income dynamics in honeybee colonies. *Apidologie* 35: 545-546.
15. Hergouth M., Petz M., **Schmickl T.**, Crailsheim K. (2004) Minimised structural complexity of honeybee colonies. *Apidologie* 35: 544-545.
16. Hrassnigg N., Brodschneider R., Riessberger-Galle U., **Schmickl T.**, Danzer M., Stabentheiner A., Crailsheim K. (2001) Observations on the grooming behaviour of worker bees (*Apis mellifera*). *Apidologie* 32: 502-503.
17. **Schmickl T.**, Crailsheim K. (2001) Survival of honeybee larvae in times of pollen stress. *Apidologie* 32: 496-498.
18. Hrassnigg N., Loidl A., Riessberger U., **Schmickl T.**, Danzer M., Stabentheiner A., Crailsheim K. (2000) Observations on the hygienic behaviour of honeybee workers (*Apis mellifera* L.). *Apidologie* 31: 649-650.
19. **Schmickl T.**, Crailsheim K. (2000) Nursing of honeybees depending on weather, resources and other hive conditions (*Apis mellifera* L.). *Apidologie* 31: 642-644.
20. **Schmickl T.**, Crailsheim K. (1998) The influence of weather conditions on brood nursing by honeybees (*Apis mellifera* L.). *Apidologie* 29: 460-462.

Abstracts in citable conference proceedings:

OR: oral presentation, talk; PO: Poster; WS: Workshop; the presenting author is listed underlined.

1. Vollmann J., Thenius R., **Schmickl T.**: (2019) Novel method for multiple parameter analyses of suboptimal brood conditions in honeybee colonies - Fast, simple and easy to handle -. Für die 66. Jahrestagung der Arbeitsgemeinschaft der Institute für Bienenforschung, Goethe-Universität, Otte-Stern-Zentrum am Uni Campus Riedberg, Frankfurt am Main (26.-28. März 2019)
2. Hahshold S., Szopek M., Radspieler G., Thenius R., **Schmickl T.**, Crailsheim K.: (2012) *Collective decision making in honeybees: temperature gradient vs social gradient*. In: (Hg.): Abstracts for the 5th Congress of the European Sections of International Union for the Study of Social Insects, Montecatini Terme, Italy (OR)
3. Kengyel D., Radspieler G., Wotawa F., **Schmickl T.** (2012): OR: *Emulation of collective honeybee behaviour by a swarm of simple robot*, für: 5th Congress of the European Sections of the International Union for the Study of Social Insects, Montecatini Terme, Italy (OR)
4. Hahshold S., Szopek M., Radspieler G., Thenius R., **Schmickl T.**, Crailsheim K. (2010) Collective Decision making in honeybees: environmental attraction factors versus socially driven aggregation. In: David R. Nash Susanne P.A. den Boer Henrik H. De Fine Licht Jacobus J. Boomsma (eds.): Abstracts for the XVI Congress of the International Union for the Study of Social Insects (*IUSSI'10*) Copenhagen, Denmark, 8-13 August 2010. (PO)
5. **Schmickl T.**, Radspieler G., Szopek M., Hahshold S., Thenius R., Wissek D., Crailsheim K. (2010) From honeybee behaviour to swarm robotics. In: David R. Nash Susanne P.A. den Boer Henrik H. De Fine Licht Jacobus J. Boomsma (eds.): Abstracts for the XVI Congress of the International Union for the Study of Social Insects (*IUSSI'10*) Copenhagen, Denmark, 8-13 August 2010. (OR)
6. Szopek M., Radspieler G., Thenius R., **Schmickl T.**, Crailsheim K. (2010) Cooperative thermotaxis of honeybees in a complex and dynamic thermal environment. In: David R. Nash Susanne P.A. den Boer Henrik H. De Fine Licht Jacobus J. Boomsma (eds.):

Abstracts for the XVI Congress of the International Union for the Study of Social Insects (*IUSSI'10*) Copenhagen, Denmark, 8-13 August 2010.. 2010. (PO)

7. Szopek M., Radspieler G., **Schmickl T.**, Thenius R., Crailsheim, K. (2008) PO: Recording and tracking of locomotion and clustering behaviour in young honeybees (*Apis mellifera*), Measuring Behavior 2008. (PO)
8. **Schmickl T.**, Thenius R., Crailsheim K. (2005) Collective decision making: A multi-agent simulation of a foraging honeybee colony. In: Bees, Ants and Termites: Applied and Fundamental Research, edited by: HH Kaatz, M Becher and RFA Moritz, IUSI International Union zum Studium der Sozialen Insekten. Halle/Saale, Germany. ISBN 3-901864-02-4. pp. 138. (OR)
9. Thenius R., **Schmickl T.**, Crailsheim K. (2005) Importance of heterogeneity in honeybee (*Apis mellifera* L.) dance-response curves for optimal foraging. In: Bees, Ants and Termites: Applied and Fundamental Research, edited by: HH Kaatz, M Becher and RFA Moritz, IUSI International Union zum Studium der Sozialen Insekten. Halle/Saale, Germany. ISBN 3-901864-02-4. pp. 140. (OR)
10. **Schmickl T.**, Crailsheim K. (2005) A mathematical model for predicting intra-colonial population dynamics of honeybees. In: Bees, Ants and Termites: Applied and Fundamental Research, edited by: HH Kaatz, M Becher and RFA Moritz, IUSI International Union zum Studium der Sozialen Insekten. Halle/Saale, Germany. ISBN 3-901864-02-4. pp. 60. (OR)
11. **Schmickl T.**, Crailsheim K. (2004) Analyzing the efficiency of honeybee foraging decisions by multi-agent simulation. In: Proceedings of the First European Conference of Apidology (EURBEE'04). 19th-24th September 2004, Udine, Italy, edited by I. Bernardelli and N. Milani, Arti Grafiche Friulane SpA, Udine, ISBN 88-86550-99-5, pp. 52. (OR)
12. Petz M., **Schmickl T.**, Crailsheim K. (2004) Simulating the adaptation of nursing to changes of colony supply to brood ratio. In: Proceedings of the First European Conference of Apidology (EURBEE'04). 19th-24th September 2004, Udine, Italy, edited by I. Bernardelli and N. Milani, Arti Grafiche Friulane SpA, Udine, ISBN 88-86550-99-5, pp. 53-54. (PO)

13. Brodschneider R., **Schmickl T.**, Crailsheim K. (2004) Individual nurse bees' behaviour in changing nursing workloads. In: Proceedings of the First European Conference of Apidology (EURBEE'04). 19th-24th September 2004, Udine, Italy, edited by I. Bernardelli and N. Milani, Arti Grafiche Friulane SpA, Udine, ISBN 88-86550-99-5, pp. 54. (PO)
14. Vollmann J., Hrassnigg N., **Schmickl T.**, Crailsheim K. (2004) Regulation of nursing workforce in a honeybee colony according to different workloads. In: Proceedings of the First European Conference of Apidology (EURBEE'04). 19th-24th September 2004, Udine, Italy, edited by I. Bernardelli and N. Milani, Arti Grafiche Friulane SpA, Udine, ISBN 88-86550-99-5, pp. 55. (PO)
15. Hergouth M., **Schmickl T.**, Crailsheim K. (2004) Efficiency of brood care behaviour in dwarf colonies. In: Proceedings of the First European Conference of Apidology (EURBEE'04). 19th-24th September 2004, Udine, Italy, edited by I. Bernardelli and N. Milani, Arti Grafiche Friulane SpA, Udine, ISBN 88-86550-99-5, pp. 55-56. (PO)
16. Thenius R., **Schmickl T.**, Crailsheim K. (2004) Formation of multiple transfers in honeybee forager-receiver interaction, a multi-agent simulation. In: Proceedings of the First European Conference of Apidology (EURBEE'04). 19th-24th September 2004, Udine, Italy, edited by I. Bernardelli and N. Milani, Arti Grafiche Friulane SpA, Udine, ISBN 88-86550-99-5, pp. 55-56. (PO)
17. **Schmickl T.**, Crailsheim K. (2001) SimBee: Simulating population dynamics and pollen management of a honeybee colony. Proceedings of the IUSSI'2001, Berlin, Germany.
18. **Schmickl T.**, Crailsheim K. (2001) SimBee: Population and resource dynamics of a honeybee colony. Symposium "From the worker to the colony" by the British section of IUSSI, Dez. 2001 in Cambridge, UK.

Other conference publications¹:

OR: oral presentation, talk; PO: Poster; WS: Workshop; PR: Presentation; the presenting author is listed underlined.

1. Karsai, I., Montano, E. and **Schmickl, T. (2015)** OR: Coexistence in an artificial pond: an agentbased simulation of an ecosystem. The Eight International Symposium on Biomathematics & Ecology: Education and Research Normal IL Oct 9-11. Abstract p 26
2. **Schmickl T. (2015)** OR: Modular bio-inspired algorithms for autonomous underwater robot swarms in CoCoRo and subCULTron. In: Proceedings of the workshop “Bioinspired underwater robotics” at IROS 2015, Hamburg, Germany.
3. **Schmickl T. (2015)** OR: Honeybee-inspired models and swarm (robotic) algorithms. In: Proceedings of the in the workshop “Social Behaviour and Self-Regulation in Insects, Swarms and Algorithms” at DZG 2015, 08.09.2015 Graz, Austria.
4. Karsai, I., **Schmickl, T. (2015)** OR: Organization of work via the common stomach. SATELLITE SYMPOSIUM IV: SOCIAL BEHAVIOUR AND SELF-REGULAION IN INSECTS, SWARMS AND ALGORITHMS. 108th Annual meeting of the German Zoological Society. 2015 Graz, Austria, Sept 08-12. Absracts p. 159. Invited keynote speaker
5. Karsai, I., **Schmickl, T. (2015)** OR: Organization of work via the common stomach in social insects. 3rd Workshop on Biological, Distributed Algorithms. Boston, MA at MIT, August 18-19. Abstract http://www.sn1.salk.edu/~navlakha/BDA2015/speaker_abstracts.txt Invited speaker
6. Mayet R., Roberz J., **Schmickl T.**, Crailsheim K. (2015) PO: Antbots: A feasible visual emulation of pheromone trails for swarm robots. at DZG 2015, Graz, Austria.
7. Szopek M., Bodi M., Schönwetter-Fuchs-Schistek S., Salem Z., Zahadat P., **Schmickl T. (2015)** OR: Biohybrid swarms: A new way to examine collective behaviours.

¹ Some of these conference presentations correspond to articles or abstracts in peer reviewed journals. The full references to those articles are listed in the previous sections.

Symposium IV: Social Behaviour and Self-Regulation in Insects, Swarm and Algorithms, of the 108th Annual Meeting of the German Zoological Society (DZG).

8. Zahadat, P., **Schmickl, T.**, (2015) PO: *Evolving Controllers for Programmable Robots to Influence Non-Programmable Lifeforms: A Case Study*, für 18th European Conference, EvoApplications 2015, Kopenhagen, Dänemark, 08.04. - 10.04.2015
9. Rössler, C., Witzmann, M., **Schmickl, T.**, (2015) PO: *Modelling "Breaking Bad": An economic model of drug and population dynamics to predict how the series itself feeds back into the drug market*, MATHMOD 2015, Vienna, Austria, 18.02. - 20.02.2015
10. Karsai, I., **Schmickl, T.**, Hamann, H. and Hilbun, A. (2014). The common stomach: Organizing task allocation in wasp societies. Symposium on Biomathematics and Ecology: Education and Research, 2014 Claremont, CA Oct. 10-12. Abstracts p. 36-37.
11. Szopek M., Hahshold S., Thenius R., Bodi M., Crailsheim K., **Schmickl T.**, (2014) PO: ASSISIbf: Honeybees and robots form a bio-hybrid society, für: ÖEG-Kolloquium 2014, Graz, Austria, 22. 3. 2014
12. Szopek M., Bodi M., Hahshold S., Thenius R., **Schmickl T.**, (2014) OR: ASSISIbf: A new pathway to examine collective behaviours in honeybees, für: 17th Congress of the International Union for the Study of Social Insects (IUSSI 2014), 13 - 18 July 2014, Cairns, Australia
13. Hahshold S., Ploder R., **Schmickl T.**, Crailsheim K. (2013) PO: *Temperaturpreferendum einzelner, junger Honigbienen in der Temperaturorgel*, für: 60. Jahrestagung der Arbeitsgemeinschaft der Institute für Bienenforschung, 2013.
14. Szopek M., Hahshold S. Thenius R., Bodi M., Crailsheim K., **Schmickl T.** (2013) PO: *Der Weg zu ASSISI|bf: Wie Honigbienen und Maschinen kollektive Entscheidungen treffen können*, für: 60. Jahrestagung der Arbeitsgemeinschaft der Institute für Bienenforschung, 2013.
15. Hahshold S., Ploder R., Radspieler G., **Schmickl T.**, Crailsheim K. (2013) PO: *Behaviour of single, young honeybees in a temperature organ*, für: XXXXIII International Apicultural Congress 29th September – 04th October 2013; Kiev 2013

16. Stradner J., Hamann H., S. F. Schwarzer C., Michiels K. N., ***Schmickl T.***, (2013) PO: *Virtual Spatiality in Agent Controllers: A Concept to Enhance Evolvability*, für EVOSTAR 2013 03th April – 05th April; Vienna 2013
17. ***Schmickl T.***, Thenius R., Zahadat P., Hahshold S., Möslinger C., (2013) PO: CoCoRo – Collective Cognitive Robots, für EVOSTAR 2013 03th April – 05th April; Vienna 2013
18. ***Schmickl T.***, Thenius R., Hahshold S., Szopek M., Crailsheim K., (2013) PO: ASSISI_bf, für EVOSTAR 2013 03th April – 05th April; Vienna 2013
19. Halloy J., Mondada F., Kernbach S., ***Schmickl T.*** (2013) PO: Towards Bio-hybrid Systems Made of Social Animals and Robots. At: Living Machines Conference 2013, London, U.K.
20. ***Schmickl T.***, Bogdan S., Correia L., Kernbach S., Mondada F., Bodi M., Gribovskiy A., Hahshold H., Miklic D., Szopek M., Thenius R., Halloy J. (2013). PO: ASSISI: Mixing Animals with Robots in a Hybrid Society. At: Living Machines Conference 2013, London, U.K.
21. ***Schmickl T.***, Szopek M., Bodi M., Hahshold S., Radspieler G., Thenius R., Bogdan S., Miklic D., Kriparic K., Haus T., Kernbach S., Kernbach O. (2013) PO: ASSISI: Charged hot bees shakin' in the spotlight, für: SASO 2013 Seventh IEEE International Conference on Self-Adaptive and Self-Organizing Systems , 2013.
22. Szopek M., Hahshold S., Thenius R., Bodi M., Crailsheim K., ***Schmickl T.*** (2013): PO: ASSISI|bf: *The path to a bio-hybrid society of honeybees and robots*, für: XXXXIII International Apicultural Congress Apimondia, 2013.
23. Bodi M., Szopek M., Radspieler G., ***Schmickl T.***, Crailsheim K. (2012) PO: *Modelling aggregation behaviour in bees and robots*, für: Eurbee 5, 2012.
24. Kengyel D. Radspieler G., Wotawa F., ***Schmickl T.*** (2012): OR: *Emulation of collective honeybee behaviour by a swarm of simple robot*, für: 5th Congress of the European Sections of the International Union for the Study of Social Insects, Montecatini Terme, Italy

25. Hahshold S., Szopek M., Radspieler G., Thenius R., **Schmickl T.**, Crailsheim K. (2012) PO: *Der Einfluss eines sozialen Gradienten auf die Entscheidung von Bienen in einem Temperaturgradienten*, für: 59. Jahrestagung der Arbeitsgemeinschaft der Institute für Bienenforschung, 2012.
26. Szopek M., Radspieler G., Thenius R., **Schmickl T.**, Crailsheim, K. (2012) PO: *Collective decision making of young honeybees in complex thermal environments*, für: 5th congress european sections of the IUSI, 2012.
27. Szopek M., Bodi M., Radspieler G., **Schmickl T.**, Crailsheim K. (2012) OR: *Modelling collective decision making in honeybees*, für: Eurbee 2012, Halle (Saale), Germany, 4.9. 2012
28. Thenius R., **Schmickl T.**, Stradner J., Zahadat P., Hahshold S., Moeslinger Ch., Szopek M., Bodi M., Crailsheim K. (2012) PO: *CoCoRo - collective cognitive robots From biology to deep-sea exploration*, für: CogSys Vienna 2012, 2012.
29. Thenius R., Dauschan M., Bodi M., **Schmickl T.**, Crailsheim K. (2011) OR: *Usage of EvoDevo in Robotic Systems*. Research Days 2011, Lakeside Labs.
30. Thenius R., Dauschan M., Bodi M., **Schmickl T.**, Crailsheim K. (2011) OR: *Regenerative abilities in modular robots using virtual embryogenesis*. International Conference on Adaptive and Intelligent Systems ICAIS'11, 2011.
31. Szopek M., Hahshold S., Thenius R., **Schmickl T.**, Crailsheim K. (2011) PO: *Wie Sozialkontakte die kollektive Entscheidung von Honigbienen beeinflussen*. 58. Jahrestagung der Arbeitsgemeinschaft für Bienenforschung, Berlin, 2011.
32. Hahshold S., Radspieler G., Szopek M., Thenius R., **Schmickl T.**, Crailsheim K. (2010) OR: *Robuste Gruppenentscheidungen bei Honigbienen*. Kolloquium der Österreichischen Entomologischen Gesellschaft 2010.
33. Hahshold S., Szopek M., Thenius R., **Schmickl T.**, Crailsheim K., (2011) PO: *How modulation of resting time affects collective decision making in honeybees*, at: Apimondia 2011.
34. Radspieler G., Thenius R., **Schmickl T.**, Crailsheim K. (2011) PO: *Stability of behavioural classes in young honeybees*, at: Apimondia 2011.

35. **Schmickl T.**, Radspieler G., Szopek M., Hahshold S., Thenius R., Wissekal D., Crailsheim K. (2010) OR: From honeybee behaviour to swarm robotics. IUSSI XVI Congress, 2010.
36. Hahshold S., Szopek M., Radspieler G., Thenius R., ***Schmickl T.***, Crailsheim K. (2010) PO: Collective decision making in honeybees: Environmental attraction factors versus socially_driven aggregation. IUSSI XVI Congress, 2010.
37. Szopek M., Radspieler G., Thenius R., **Schmickl T.**, Crailsheim K. (2010) PO: Cooperative thermotaxis of honeybees in a complex and dynamic thermal environment. IUSSI XVI Congress, 2010.
38. Thenius R., Radspieler G., ***Schmickl T.***, Crailsheim K. (2010) PO: Novel low-budget method for observing honeybee behaviour in temperature fields. IUSSI XVI Congress, 2010.
39. Hahshold S., Radspieler G., Thenius R., ***Schmickl T.***, Crailsheim K. (2010) PO: Kooperative Thermotaxis bei Honigbienen: Sozialer Gradient vs. Temperaturgradient. 57. Jahrestagung der Arbeitsgemeinschaft für Bienenforschung, 2010.
40. Szopek M., Radspieler G., Thenius R., ***Schmickl T.***, Crailsheim K. (2010) PO: Kooperative Thermotaxis bei Honigbienen: Flexibles Gruppenverhalten in einer dynamischen Umwelt. 57. Jahrestagung der Arbeitsgemeinschaft für Bienenforschung, 2010.
41. Mayet R., Roberz J., Schmickl T., Crailsheim K. (2010) PO+OR: Antbots: A feasible visual emulation of pheromone trails for swarm robots. ANTS 2010 – Seventh International Conference on Swarm Intelligence, 2010.
42. Thenius R., Bodi M., *Schmickl T.*, Crailsheim K. (2010) OR: Using virtual embryogenesis for structuring controllers. ICARIS 2010.
43. Bodi M., Thenius R., ***Schmickl T.***, Crailsheim K. (2009) OR: How two cooperating robot swarms are affected by two conflictive aggregation spots. European Conference on Artificial Life (ECAL'09) Budapest, Hungary, 2009.

44. Hamann H., **Schmickl T.**, Crailsheim K. (2009) PO: Evolving for Creativity: Maximizing Complexity in a Self-Organized Multi-Particle System. European Conference on Artificial Life (ECAL'09) Budapest, Hungary, 2009.
45. Kengyel D., Schmickl T., Hamann H., Thenius R., Crailsheim K. (2009) OR: Embodiment of Honeybee's Thermotaxis in a Mobile Robot Swarm. European Conference on Artificial Life (ECAL'09) Budapest, Hungary, 2009.
46. Möslinger Ch., **Schmickl T.**, Crailsheim K. (2009) OR: A Minimalist Flocking Algorithm for Swarm Robots. European Conference on Artificial Life (ECAL'09) Budapest, Hungary, 2009.
47. **Schmickl T.**, Crailsheim K. (2009) OR: Economics of Specialization in Honeybees. A multi-agent simulation study of honeybees. European Conference on Artificial Life (ECAL'09) Budapest, Hungary, 2009.
48. Stradner J., Hamann H., **Schmickl T.**, Thenius R., Crailsheim K. (2009) PO: Evolving a novel bio-inspired controller in reconfigurable robots. European Conference on Artificial Life (ECAL'09) Budapest, Hungary, 2009.
49. Thenius R., Bodi M., **Schmickl T.**, Crailsheim K. (2009) PO: Growth of structured artificial neural networks by virtual embryogenesis. European Conference on Artificial Life (ECAL'09) Budapest, Hungary, 2009.
50. **Schmickl T.**, Stradner J., Hamann H., Crailsheim K. (2009) PO: Major feedbacks that support artificial evolution in multi-modular robotics. in: EVODEROB workshop, IEEE/RSJ International Conference on Intelligent RObots and Systems (IROS'09), St. Louis, MO, USA, October 11-15, 2009.
51. Stradner J., Hamann H., **Schmickl T.**, Crailsheim K. (2009) OR: Analysis and Implementation of an Artificial Homeostatic Hormone System: A First Case Study in Robotic Hardware. IEEE/RSJ International Conference on Intelligent RObots and Systems (IROS'09), St. Louis, MO, USA, October 11-15, 2009
52. Sattler B., Thenius R., Reichel O., **Schmickl T.** (2009) PO: Is a one-dimensional simulator sufficient to evaluate algorithms for swarm robotics? MATHMOD 2009, Vienna.

53. Hahshold S., Radspieler G., Thenius R., **Schmickl T.**, Crailsheim K. (2009) OR: Cooperative Thermotaxis in Honeybees: Duration of Cluster Formation and Robustness. 1st Central European Meeting of the International Union for the Study of Social Insects (IUSI), 11.10.2009.
54. Radspieler G., Szopek M., Hahshold S., Thenius R., **Schmickl T.**, Crailsheim K. (2009) OR: Behavioural classes among young honeybees in a temperature gradient. 1st Central European Meeting of the International Union for the Study of Social Insects (IUSI), 11.10.2009.
55. Szopek M., Radspieler G., Thenius R., **Schmickl T.**, Crailsheim K. (2009) OR: Make a walk to the warm(est) side. 1st Central European Meeting of the International Union for the Study of Social Insects (IUSI), 11.10.2009.
56. Thenius R., Radspieler G., Szopek M., **Schmickl T.**, Crailsheim K. (2009) Novel method for observation of honeybee behaviour in a two-dimensional temperature gradient. 1st Central European Meeting of the International Union for the Study of Social Insects (IUSI), 11.10.2009.
57. Hahshold S., Radspieler G., Thenius R., **Schmickl T.**, Crailsheim K. (2009) PO: Kooperative Thermotaxis bei Honigbienen: Wie robust sind Gruppenentscheidungen? Jahrestagung der Arbeitsgemeinschaft der Institute für Bienenforschung, Schwerin, 2009.
58. Hahshold S., Radspieler G., Thenius R., **Schmickl T.**, Crailsheim K. (2009) PO: Robustness of group decisions in honeybees. APIMONDIA 2009.
59. Szopek M., Radspieler G., Thenius R., **Schmickl T.**, Crailsheim K. (2009) PO: The influence of group size on cooperative decision making in honeybees. 41st APIMONDIA 2009.
60. Szopek M., Radspieler G., Thenius R., **Schmickl T.**, Crailsheim K. (2009) PO: Kooperative Thermotaxis bei Honigbienen: Gruppenentscheidungen in einem komplexen Temperaturgradienten. 56. Jahrestagung der Arbeitsgemeinschaft für Bienenforschung, 2009.
61. Vollmann J., Thenius R., **Schmickl T.**, Crailsheim K. (2009) PO: Berührungslose Altersbestimmung von Honigbienenlarven (*Apis mellifera carnica* Pollm.) 56.

- Jahrestagung der Arbeitsgemeinschaft der Institute für Bienenforschung e.V. March 2009. Schwerin (Mecklenburg-Vorpommern), 2009.
62. **Schmickl T.**, Thenius R. Möslinger Ch., Crailsheim K. (2009) OR: Bio-Inspiration als Weg zu intelligenten Roboterschwärmen. PR: Kolloquium der Österreichischen Entomologischen Gesellschaft, Graz, Austria, 21st March, 2009.
63. Szopek M., Radspieler G., Thenius R., ***Schmickl T.***, Crailsheim K. (2009). OR: Verhalten junger Honigbienen in zweidimensionalen Temperaturgradienten. Kolloquium der Österreichischen Entomologischen Gesellschaft, Graz, Austria, 21st March, 2009.
64. Baele G., Bredeche N., Haasdijk E., Maere S., Michiels N., Van de Peer Y., ***Schmickl T.***, Schwarzer Ch., Thenius, R. (2009) Open-ended On-board Evolutionary Robotics for Robot Swarms. PO: IEEE Congress on Evolutionary Computation (CEC'09) Trondheim, Norway, 18th -21st of May, 2009.
65. Szymanski M., Winkler L., Laneri D., Schlachter F., van Rossum A.C., ***Schmickl T.***, Thenius R. (2009) SymbricatorRTOS: A Flexible and Dynamic Framework for Bio-Inspired Robot Control Systems and Evolution. PO: IEEE Congress on Evolutionary Computation (CEC'09) Trondheim, Norway, 18th -21st of May, 2009.
66. ***Schmickl T.***, Crailsheim K. (2009) Modelling a hormone-based robot controller. OR: MATHMOD 2009 Vienna , Austria 11th -13th February 2009.
67. Thenius R., ***Schmickl T.***, Crailsheim K. (2009) Novel concept of modelling embryology for structuring an artificial neural network. OR: MATHMOD 2009 Vienna , Austria 11th -13th February 2009.
68. Radspieler G., Thenius R., ***Schmickl T.*** (2009) OR: Individual-based modelling of temperature-induced aggregation behaviour. OR: MATHMOD 2009 Vienna , Austria 11th -13th February 2009.
69. Bodi M., Thenius R., ***Schmickl T.***, Crailsheim K. (2009) OR: Robustness of two interacting robot swarms using the BEECLUST algorithm. OR: MATHMOD 2009 Vienna , Austria 11th -13th February 2009.

70. Szopek M., Radspieler G., **Schmickl T.**, Thenius R., Crailsheim K. (2008) PO: Recording and tracking of locomotion and clustering behaviour in young honeybees (*Apis mellifera*). Measuring Behavior, 2008.
71. Radspieler G., **Schmickl T.**, Thenius R., Crailsheim K. (2008) PO: Behavioural Analysis of the aggregation. EURBEE 3, Symposium: Behaviour and Physiology (Sandoz), 2008.
72. Radspieler G., Thenius R., **Schmickl T.**, Crailsheim K. (2008) PO: Behavioural groups of young honeybees in a two-dimensional temperature gradient. IUSSI Conference in La Roch en Ardenne (Belgien), 2008.
73. Crailsheim K., Möslinger Ch., **Schmickl T.** (2008) OR: Trophallaxis of bees inspired a robotic swarm. EurBee 3, Belfast, 2008.
74. Crailsheim K., Thenius R., Möslinger Ch., Radspieler G., **Schmickl T.** (2008) Honeybee-derived aggregation of swarm robots. IUSSI 2008.
75. **Schmickl T.**, Crailsheim K. (2008) Analysing honeybees' division of labour in broodcare by a multi-agent model. OR: Artificial Life XI, Winchester, UK, 5th-8th August, 2008.
76. Kernbach S., Meister E., Schlachter F., Jebens K., Szymanski M., Liedke J., Laneri D., Winkler L., **Schmickl T.**, Thenius R., Corradi P., Ricotti L (2008) Symbiotic Robot Organisms: Replicator and Symbion Projects. OR: **PerMIS 08**, August 19-21, 2008, Gaithersburg, MD, USA
77. Hamann H., Wörn H., Crailsheim K., **Schmickl T.** (2008) Spatial Macroscopic Models of a Bio-Inspired Robotic Swarm Algorithm. OR: IEEE/RSJ International Conference on Intelligent Robots and Systems, **IROS'08**, Nice, 2008
78. Corradi P., **Schmickl T.**, Scholz O., Menicassi A., Dario P. (2008) Optical Networking in a Swarm of Microrobots. OR: 3rd International Conference on Nano-Networks. **Nano-Net 2008**, Boston, Massachusetts, September 14-16, 2008.
79. **Schmickl T.**, Crailsheim K. (2008) An individual-based model of task selection in honeybees. OR: Simulating Adaptive Behavior (SAB'08), Osaka, Japan, 7th - 12th July 2008.

80. **Schmickl T.** (2008) Individual-based models of honeybee intra-colonial regulation: Task-selection, nutrient allocation, brood care and navigation. OR: Workshop on Modelling Complex Biological Systems, 17th-18th April 2008, Uppsala, Sweden.
81. Thenius, R., **Schmickl, T.**, Crailsheim, K. (2008) How to know without having been there? Investigating communication channels in the nectar collecting system of a honeybee colony. OR: Artificial Life XI, Winchester, UK, 5th-8th August, 2008.
82. Karsai I., **Schmickl T.**, Knisley J. (2007) Integrating Math and Biology through Storytelling: The Salmon Example. OR at: MathFest 2007, San Jose, CA, 3rd – 5th Aug. 2007, USA.
83. Radspieler G., Thenius R., **Schmickl T.**, Crailsheim K. (2007) Behaviour of honeybees in a two-dimensional temperature gradient. PO at : 20th meeting of the German section of the IUSSE, 25th-28th Sept. 2007, Bochum, Germany.
84. Thenius R., **Schmickl T.**, Kornienko S., Crailsheim K. (2007) Bee-derived collision based algorithm tested in a micro-robot-swarm. PO at: 20th meeting of the German section of the IUSSE, 25th-28th Sept. 2007, Bochum, Germany.
85. **Schmickl T.**, Crailsheim K. (2006) A Navigation Algorithm for Swarm Robotics Inspired by Slime Mold Aggregation. OR at: Second SAB 2006 International Workshop on Swarm Robotics, Rome, 30th Sept. – 1st Oct. 2006, Italy.
86. **Schmickl T.**, Möslinger, C., Crailsheim K. (2006) Collective perception in a robot swarm. OR at: Second SAB 2006 International Workshop on Swarm Robotics, Rome, 30th Sept. – 1st Oct. 2006, Italy.
87. **Schmickl T.**, Crailsheim K., (2006) Bubbleworld.evo: Artificial evolution of behavioral decisions in a simulated predator-prey ecosystem. OR at: 9th International Conference on Simulating Adaptive Behavior (SAB'06), Rome, 35th – 30th Sept2006, Italy.
88. Thenius R., **Schmickl T.**, Crailsheim K., (2006) Economic optimisation in honeybees: adaptive behaviour of a superorganism. PO&OR at: 9th International Conference on Simulating Adaptive Behavior (SAB'06), Rome, 35th – 30th Sept2006, Italy.

89. **Schmickl T.**, Crailsheim K. (2006) Trophallaxis among swarm-robots: A biologically inspired strategy for swarm robotics. OR at: 1st IEE/RAS-EMBS International Conference on Biomedical Robotics and Biomechanotronics (BIOROB'06), Pisa, 20th - 22th Feb. 2006, Italy.
90. **Schmickl T.**, Crailsheim K. (2006) Modelling the self-organized division of labour in honeybees. OR at: 5th Vienna Symposium on Mathematical Modelling (MATHMOD'06), Vienna, 8th-10th Feb. 2006 Austria.
91. Thenius R., **Schmickl T.**, Crailsheim K. (2006) Modelling nectar-collecting behaviour in a honeybee colony. OR at: 5th Vienna Symposium on Mathematical Modelling (MATHMOD'06), Vienna, 8th-10th Feb. 2006 Austria.
92. Riessberger-Galle U. **Schmickl T.**, Crailsheim K. (2006) How does pollen deprivation and social deprivation affect food exchange and other social contacts in honeybees? PO at: Conference of the International Union for the Study of Social Insects, 30th July- 5th Aug. 2006, Washington, D.C., USA
93. Thenius R., Schmickl T., Crailsheim K. (2006) How do Babybees find a Temperature Optimum? OR at: European Conference of Apidology (EURBEE 2006) 10th-14th Sept. 2006, Prague, Czech Republic.
94. Thenius R., **Schmickl T.**, Crailsheim K. (2005) The “Dance or Work” Problem: Why Do not all Honeybees Dance with Maximum Intensity. OR at: 4th International Central and Eastern European Conference on Multi-Agent Systems, 15th – 17th Sept. 2005, Budapest, Hungary.
95. **Schmickl T.**, Thenius R., Crailsheim K. (2005) Simulating Swarm Intelligence in Honey Bees: Foraging in Differently Fluctuating Environments PO at: Genetic and Evolutionary Computation Conference (GECCO'05), 25th-29th June, 2005, Washington, DC, USA.
96. **Schmickl T.** (2005) Multi-Agentensimulation der dezentralen Regulation der Arbeitsteilung bei Honigbienen. OR at: 2nd CEQUACOS meeting, 6th Oct. 2005, Graz, Austria.

97. **Schmickl T.**, Thenius R., Crailsheim K. (2005) Simulating the regulation of task selection in honeybees. OR at: 3rd European Congress on Social Insects, 21st-29th Aug. 2005, St-Petersburg, Russia.
98. **Schmickl T.**, Thenius R., Crailsheim K. (2005) Modelling multiple transfer and nectar flow in honeybees. OR at: 3rd European Congress on Social Insects, 21st-29th Aug. 2005, St-Petersburg, Russia.
99. Schmickl T. (2005) Kollektive Sammel-Entscheidungen: Eine Multi-Agenten-Simulation einer Honigbienen-kolonie. OR at: Kolloquium der Entomological Society of Austria (ESA, OEG), St. Pölten, Austria.
100. Crailsheim K., Thenius R., ***Schmickl T.*** (2005) Distribution of honeybee foragers on nectar patches: a computer-simulation study. PO at: APIMONDIA conference 21th – 26th Aug. 2005 in Dublin, Ireland.
101. Vollmann J., ***Schmickl T.***, Crailsheim K. (2004) The reaction of honeybee colonies to different quantities of brood. PO at German Bee Research Seminar, Münster, Germany.
102. Thenius R., ***Schmickl T.***, Crailsheim K. (2004) Multi-factoral simulation of the nectar income dynamics in honeybee colonies. . PO at German Bee Research Seminar, Münster, Germany.
103. Hergouth M., Petz M., ***Schmickl T.***, Crailsheim K. (2004) Minimised structural complexity of honeybee colonies. . PO at German Bee Research Seminar, Münster, Germany.
104. Schmickl T. (2004) Computersimulation bei sozialen Insekten. Expert talk of the Austrian Entomological Society (ESA, OEG), 16th Oct. 2004, Graz, Austria.
105. **Schmickl T.**, Crailsheim K. (2003) Costs of environmental fluctuations and benefits of dynamic decentralized foraging decisions in honey bees. OR at: 2nd International Workshop on the Mathematics and Algorithms of Social Insects, Georgia Institute of Technology, 15th-17th Dec. 2003, Atlanta, USA.
106. **Schmickl T.**, Crailsheim K. (2003) A honeybee population model with special emphasis on resource management and division of labor. OR at: 4th IMACS

Symposium on Mathematical Modeling (MATHMOD'03), 5th –7th Feb., 2003, Vienna, Austria.

107. **Schmickl T.**, Crailsheim K. (2003) Simulating honeybee foraging decisions based on individual stimuli responses. PO at: 18th Congress of the IUSSI Central European Section, Regensburg, Germany.
108. **Schmickl T.**, Crailsheim K. (2001) SimBee: Population and resource dynamics of a honeybee colony. PO at: From Worker to Colony: Understanding the Organisation of Insect Societies (Annual winter meeting of the British section of the IUSSI), 7th - 8th Dec. 2001, Cambridge, UK.
109. **Schmickl T.**, Crailsheim K. (2001) simBee: Simulating population dynamics and pollen management of a honeybee colony. PO at: Meeting of the European Sections of the International Union for the Study of Social Insects, 25th – 29th Sept. 2001, Berlin, Germany.
110. Hrassnigg N., Brodschneider R., Riessberger-Galle U., ***Schmickl T.***, Danzer M., Stabentheiner A., Crailsheim K. (2001) Observations on the grooming behaviour of worker bees (*Apis mellifera*). PO at German Bee Research Seminar, Münster, Germany.
111. **Schmickl T.**, Crailsheim K. (2001) Survival of honeybee larvae in times of pollen stress. OR at: German Bee Research Seminar, Bad Neuenahr, Germany.
112. Hrassnigg N., Loidl A., Riessberger U., ***Schmickl T.***, Danzer M., Stabentheiner A., Crailsheim K. (2000) Observations on the hygienic behaviour of honeybee workers (*Apis mellifera* L.). PO at: German Bee Research Seminar, Blaubeuren, Germany.
113. **Schmickl T.**, Crailsheim K. (2000) Nursing of honeybees depending on weather, resources and other hive conditions (*Apis mellifera* L.). OR at: German Bee Research Seminar, Blaubeuren, Germany.
114. **Schmickl T.**, Crailsheim K. (2000) Brutkannibalismus bei der Honigbiene (*Apis mellifera carnica*) Wie Honigbienen die Größe ihres Brutnestes bei längeren Schlechtwetterperioden regulieren. OR at: Kolloquium of the Entomological Society of Austria (ESA/OEG), Vienna, Austria.

115. ***Schmickl T.***, Crailsheim K. (1999) Nursing and brood cannibalism depending on pollen and weather. PO at: 36th APIMONDIA conference, September 1999, Vancouver, Canada.
116. ***Schmickl T.***, Crailsheim K. (1998) The influence of weather conditions on brood nursing by honeybees (*Apis mellifera* L.). PO at: German Bee Research Seminar, Bremen, Germany.

Participated Conferences and International Workshops:

2019: Ars Electronica 2019 (2 contribution), Linz, Austria; Kapelica Gallery – Artificial Life Symposium (2 contribution), Ljubljana, Slovenia, Workshop-subCULTron (1 contribution), Venedig, Italien; EU European Innovation Days (2 contributions), Brüssel, Belgien; Workshop Hiveopolis (5 contributions) Berlin, Deutschland; ALIFE 2019 (3 contributions), Newcastle, England;

2018: ICTP 2018 (1 contribution), Triest, Italy; Ars Electronica 2018 (1 contribution), Linz, Austria; "SCIENTIFIC & ROBOTICA" (1 contribution), Lausanne, Schweiz

2017: 4th Faculty of Biology AMU Conference-2017 (1 contribution); IEEE ALIFE 2017 (3contributions),

2016: Workshop "Berechnete Tiere. Technik und Verdattung in den Human-Animal-Studies" 2016 (2 contributions), Bochum, Germany, CAMS 2016 (1 contribution), Ars electronica 2016 (1 contribution),

2015: MATHMOD 2015 (2 contributions), Vienna, Austria, EVOSTAR 2015 (1 contribution), Kopenhagen, Denmark; ECAL 2015 (2 contributions), York, UK; DZG 2015 (6 contributions), Graz, Austria; PRIMA 2015 (1 contribution), Bertinoro, Italy.

2014: SASO 2014 (1 contribution), London UK, GECCO 2014 (1 contribution), Vancouver Canada, EVOSTAR 2014 (1 plenary talk), Granada, Spain, IUSSI 2014 (1 contribution), Cairns, Australia, ÖEG-Koloquium 2014 (2 contributions), Graz, Austria, Symposium on Biomathematics and Ecology: Education and Research 2014 (1 contribution) Claremont, CA

2013: TAROS 2013, Oxford, U.K. (1 contribution); ECAL 2013, Taormino, Italy (5 contributions); Living Machines 2013, London, U.K. (2 contributions); SASO 2013,

Philadelphia, U.S.A. (1 contribution); Apimondia, Kiev, Ukraine (2 contributions); German Bee Research Seminar, Würzburg, Germany (2 contributions).

2012: EurBee 2012, Halle an der Saale (3 contributions); IUSSI 2012, Montecatini Terme, Tuscany, Italy (3 contributions); German Bee Research Seminar, Bonn, Germany (2 contributions), SAB, Odense, Denmark (1 contribution).

2011: SSCI'11, Paris, France (1 contribution); FET Conference, Budapest, Hungary (1 contribution); GECCO'11, Dublin, Ireland (1 contribution); ICAR'11, Tallinn, Estonia (1 contribution); IROS'11, San-Francisco, USA (2 contributions); SASO'11, Ann Arbor, USA (1 contribution); ICAIS'11, Klagenfurt, Austria; BIONETICS 2011, York, UK.

2010: ICRA'10, Anchorage, USA (1 contribution); CEC'10, Barcelona, Spain (1 contribution), ANTS'10, Brussels, Belgium (2 contributions); Alife XII, Odense, Denmark (3 contribution), IUSSI 2010, Copenhagen, Denmark (5 contributions); SAB'10, Paris, France (1 contribution).

2009: German Bee Research Seminar, Schwerin, Germany (3 contributions); APIMONDIA Montpellier, France (2 contributions); OEG Kolloquium, Graz, Austria (2 contributions); IROS, St. Luis USA (2 contributions); ADAPTIVE 2009, Athens, Greece (1 contribution); IUSSI 2009 Fraueninsel Chiemsee, Germany (3 contributions); ECAL 2009, Budapest, Hungary (7 contributions); MATHMOD, Vienna, Austria (5 contributions); IEEE Congress on Evolutionary Computation (CEC'09), Trondheim, Norway (2 contributions).

2008: Measuring Behavior 2008, Maastricht, Netherlands (1 contribution); 4th European Meeting of the IUSSI (IUSSI'08), La Roche-en Ardenne, Belgium (2 contributions); 3rd European Conference of Apidology (EURBEE'08), Belfast, Northern Ireland (1 contribution); Workshop on Modelling Complex Biological Systems, Uppsala, Sweden (1 contribution); Simulating Artificial Behaviour, Osaka, Japan (1 contribution); Artificial Life XI, Winchester, U.K. (2 contributions); PerMis 08, Gaithersburg, USA (1 contribution); International Conference on Intelligent Robots and Systems, Nice, France (1 contribution); International Conference on Nano-Networks, Boston, USA (1 contribution)

2007: Quantitative Biology Curriculum Planning Workshop, Johnson City, USA (participation); MathFest, San Jose, USA (1 contribution); IUSSI, Bochum, Germany (2 contributions)

2006: MATHMOD, Vienna, Austria (2 contributions); SAB Conference, Rome, Italy (2 contributions); SAB workshop on swarm robotics, Rome, Italy (2 contributions); BIOROB, Pisa, Italy (1 contribution); EURON, Palermo, Italy (participation); EUROBEE, Prague, Czech Republic (1 contribution); IUSSI Washington, USA (1 contribution)

2005: IUSSI, Halle, Germany (3 contributions); GECCO, Washington, USA (1 contribution); CEEMAS, Budapest, Hungary (1 contribution); EURON, Warsaw, Poland (1 workshop); CEQUACOS, Graz, Austria (1 contribution); IUSSI, St.Petersburg, Russia (2 contributions); OEG/ESA Colloquium, St. Pölten, Austria (2 contributions); EURON, Warsaw, Poland (1 workshop contribution); APIMONDIA, Dublin, Ireland (1 contribution)

2004: EURBEE, Udine, Italy (6 contributions); OEG/ESA Expert talk, Graz, Austria (1 contribution); German Bee Research Seminar, Münster, Germany (3 contributions)

2003: IUSSI, Regensburg, Germany (1 contribution); MASI, Atlanta, USA (1 contribution); MATHMOD, Vienna, Austria (1 contribution); European Forum Alpbach (participation)

2002: CEQUACOS, Graz, Austria (1 contribution); Bienentag, Lunz, Austria (1 contribution); European Forum Alpbach (participation).

2001: German Bee Research Seminar, Bad Neuenahr, Germany (2 contributions); IUSSI, Cambridge, England (1 contribution); IUSSI, Berlin, Germany (1 contribution)

2000: German Bee Research Seminar, Blaubeuren, Germany (2 contributions); OEG/ESA Expert talk, Vienna, Austria (1 contribution)

1999: APIMONDIA, Vancouver, Canada (1 contribution)

1998: German Bee Research Seminar, Bremen, Germany (1 contribution)