

Thomas (Tom) Bochynek, Ph.D., Dipl.-Biol.

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Education

Ph.D., Information Technology <i>Monash University</i> Thesis on self-organised infrastructure construction in leaf-cutter ants Modeling of collective mechanism, energetics, and evolution	09/2013 - 03/2017 <i>Melbourne, Australia</i>
Dipl.Biol. (~B.Sc. + M.Sc.), Behavioural Ecology <i>Ruhr-Universität Bochum - highest grade "sehr gut"</i> Thesis on collective nest-construction in weaver ants Statistical analysis of experiments and visualisation of ant clustering	07/2004 - 10/2011 <i>Bochum, Germany</i>

Research Experience

Postdoctoral Fellow, School of Engineering, Northwestern University Investigating self-assembly in <i>Eciton</i> army ants	07/2018 - ongoing
Postdoctoral Research Assistant, School of Biol. Sci., Monash University Modeling the evolution of sex allocation in basal plants	10/2017 - 02/2018
Research Assistant, SensiLab, Monash University Design of models and AI of palaeontological lifeforms for Augmented Reality teaching application	06/2015 - 03/2017
Research Assistant, Machine Learning Group, Monash University Annotation of medical records for automated data extraction	06/2015 - 09/2016
Research Assistant, Behavioural Ecology Group, James Cook University Collection and statistical analysis of behavioural data on weaver ant nest construction; lab management	03/2011 - 11/2011

Teaching Experience

Sessional Lecturer, Faculty of IT, Monash University Delivery of class "AI, ALife, and digital environments". Giving lectures and practical coding classes, designing exams.	02/2018 - 06/2018
Teaching Associate, School of Biological Sciences, Monash University Supervision of practical second year biology course	07/2014 - 10/2014
Teaching Associate, Behavioural Biology Group, Ruhr-Universität Bochum Design and teaching of experiments in undergraduate course "Behavioural Ecology"	08/2009 - 02/2010

Publications

Please visit [Google Scholar](https://scholar.google.com/citations?user=...) for current list.

1. **Bochynek, T.**, Tanner, J., Meyer, B., and Burd, M. (2017) – Parallel foraging cycles for different resources in leaf-cutting ants: a clue to the mechanisms of rhythmic activity. [Ecological Entomology](#)
2. **Bochynek, T.**, Meyer, B., and Burd, M. (2017) – Energetics of trail clearing in the leaf-cutter ant *Atta*. [Behavioral Ecology and Sociobiology](#)
3. **Bochynek, T.** and Robson, S. K. A. (2014) – Physical and Biological Determinants of Collective Behavioural Dynamics in Complex Systems: Pulling Chain Formation in the Nest-Weaving Ant *Oecophylla smaragdina*. [PLOS ONE](#)

4. Shmanina, T., Zukerman, I., Cheam, A. L., **Bochynek, T.**, Cavedon, L (2016) – Corpus of Tables in Full-Text Biomedical Research Publications. [Conference on Computational Linguistics 2016](#)
5. Ihlow, F., Rödger, D., **Bochynek, T.**, Sothanin, S., Handschuh, M., Böhme, W. (2014) – Reinforcement as a conservation tool assessing site fidelity and movement of the endangered elongated tortoise *Indotestudo elongata* (Blyth, 1854). [Journal of Natural History](#)

Conference Presentations

Mechanism and regulation of self-organised infrastructure construction	ECCS 2016
(Invited) Regulatory mechanism in leaf-cutter ant foraging	ECCS 2016
Concurrent foraging patterns in leaf-cutter ants <i>Atta</i>	ASSAB 2016
Costs and benefits of clearing physical trails in leaf-cutter ants <i>Atta</i>	Behaviour 2015
Dynamics of collective worksite selection in weaver ants, <i>Oecophylla smaragdina</i>	IUSSI 2014

Acronyms: ECCS = European Conference on Complexity Systems, ASSAB = Australian Society for the Study of Animal Behaviour, IUSSI = International Union for the Study of Social Insects

Awards & Scholarships

Monash University Postgraduate Publication Award (AUD ~4500)	2016
Faculty of IT Supplementary Funding Award, used for research visit (AUD 5000)	2016
Best Student Presentation award at ASSAB 2016 conference (signed textbook)	2016
Three Minute Thesis competition faculty round winner (AUD 500)	2015
“Highly commended” poster at Monash IT Innovation Showcase	2015
Two national and one state prize at GovHack Hackathon (Team effort, AUD 1500)	2015
Monash International Postgrad Research Scholarship (AUD ~27,000 p.a., for 3.5 years)	2013
CSIRO Data61 / NICTA Top-up Scholarship (AUD ~7000 p.a., for 3.5 years)	2013
Monash University Faculty Scholarship (covers fees of AUD ~37,000 p.a., for 3.5 years)	2013
Total funds: AUD ~260,000	

Skills

Programming languages: Python, Mathematica, Matlab, Java, C++, L^AT_EX

Computational skills: Agent-based and system modeling in Python and Mathematica; data extraction via computer vision using OpenCV; machine learning using artificial neural networks and genetic algorithms; Evolutionary Game Theory simulation; Cellular Automata

Experimental skills: Experimental setup construction: CAD & 3D printing, Arduino-based setup control, automated data extraction. Behavioural experiment design and execution, field work experience on 4 continents.

Other proficiencies: Git, Unix/Linux, ImageJ, GIS, Adobe & MS Office suites

Visited Institutions

La Selva Research Station, Costa Rica	2017
Prof. Simon Robson, James Cook University, Australia	2017
Dr. Ana Duarte, Exeter University, UK	2016
Prof. Christoph Kleineidam, Konstanz University, Germany	2014
Smithsonian Tropical Research Institute, Panama	2013
Prof. Simon Robson, James Cook University, Australia	2010-2011
Danum Valley Field Centre (for Ant Course), Sabah, Malaysia	2010
Panay Eco-Social Conservation Project, Philippines	2009

Professional Activities

Reviewer for PLOS ONE (2x), Insectes Sociaux (2x), Journal of Insect Behaviour (declined due to lack of time)

Initiator, organiser, and moderator of 2-day [Monash IT Research Retreat](#). Event received ~AUD 70,000 in faculty funds. Led a team of 10 PhD students for 8 months, organising guest-speakers and research workshops. Event brought together PhD students from 3 Monash campuses (including from Malaysia)

Member of the Australian Society for the Study of Animal Behaviour (ASSAB)

Student Representative to the IT Graduate Research Committee. Aided in shaping faculty policies

Supervisor of ~15 biology undergraduate student volunteers aiding in data extraction, over duration of 1.5 years

Four-time speaker at Monash PhD Student Induction Day; Presenter at Monash University Open Days and Innovation Showcases; Presenter at NICTA Tech Showcase

Student Representative on Monash University academic conduct committees

Other Passions

Fishing, camping, hiking, snorkelling & diving, photography, travelling, juggling, drawing & painting, carving & crafts. Book worm and e-book aficionado, avid tea sampler.