Thomas (Tom) Bochynek, Ph.D., Dipl.-Biol.
628 Library Pl., Apt. B3S
Evanston, IL
USA

+1 (872) 302 9427
Tom.Bochynek@gmail.com
www.thomasbochynek.com

Curriculum Vitae

Education

Ph.D., Information Technology 09/2013 - 03/2017
Monash University *Melbourne, Australia*

- Thesis on self-organised infrastructure construction in leaf-cutter ants
- Modeling of collective mechanism, energetics, and evolution

Dipl.Biol. (~B.Sc. + M.Sc.), Behavioural Ecology 07/2004 - 10/2011
Ruhr-Universität Bochum - highest grade "sehr gut" *Bochum, Germany*

- Thesis on collective nest-construction in weaver ants
- Statistical analysis of experiments and visualisation of ant clustering

Research Experience

Postdoctoral Fellow, School of Engineering 07/2018 - ongoing
Northwestern University *Evanston, USA*

Investigating self-assembly in *Eciton* army ants

Postdoctoral Research Assistant, School of Biological Sciences 10/2017 - 02/2018
Monash University *Melbourne, Australia*

Designed evolutionary models of sex allocation in basal plants

Research Assistant, SensiLab 06/2015 - 03/2017
Monash University *Melbourne, Australia*

Designed behavioural AI of palaeontological lifeforms for Augmented Reality teaching application

Research Assistant, Machine Learning Group 06/2015 - 09/2016
Monash University *Melbourne, Australia*

Annotated medical records for automated data extraction and contributed to design of semantic framework

Research Assistant, Behavioural Ecology Group 03/2011 - 11/2011
James Cook University *Townsville, Australia*

Collected and statistically analysed behavioural data on ant nest construction and managed laboratory space

Teaching Experience

Sessional Lecturer, Faculty of Information Technology 02/2018 - 06/2018
Monash University *Melbourne, Australia*

Primary lecturer of class "AI, ALife, and digital environments". Delivered lectures and lead practical coding classes, designed and graded exams and class assignments.

Teaching Associate, School of Biological Sciences 07/2014 - 10/2014
Monash University *Melbourne, Australia*

Supervised second year biology course and demonstrated laboratory techniques

Teaching Associate, Behavioural Biology Group 08/2009 - 02/2010
Ruhr-Universität *Bochum, Germany*

Designed and taught experiments in undergraduate course "Behavioural Ecology", and marked reports.

Supervision Experience

Mr. James Tanner, Monash University, Australia. Unofficial supervisor of Undergraduate Research Experience class student. Oversaw data extraction and analysis of different foraging cycles in leaf-cutter ants. Results published in journal article.

Supervisor of 15 biology undergraduate student volunteers aiding in data extraction over duration of 1.5 years. Delivered talk for context and introduced general data extraction standard operating procedures.

Publications

Please visit Google Scholar for current list.

1. **Bochynek, T.**, Burd, M., Kleineidam, C.J., and Meyer, B. (2019) – Infrastructure construction without information exchange: the trail clearing mechanism in *Atta* leafcutter ants. Proceedings of the Royal Society B: Biological Sciences
2. **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
3. **Bochynek, T.**, Meyer, B., and Burd, M. (2017) – Energetics of trail clearing in the leafcutter ant *Atta*. Behavioral Ecology and Sociobiology
4. Macfarlan, B., Anderson, M., Boyce, J., Chandler, T., **Bochynek, T.**, Yeates, M., and Maynard, C. (2017) – Monash Rocks: The first step in an augmented reality journey through deep time. In H. Partridge, K. Davis, & J. Thomas. (Eds.), Me, Us, IT! Proceedings ASCILITE2017: 34th International Conference on Innovation, Practice and Research in the Use of Educational Technologies in Tertiary Education (pp. 138-141).
5. **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
6. Shmanina, T., Zukerman, I., Cheam, A. L., **Bochynek, T.**, and Cavedon, L. (2016) – Corpus of Tables in Full-Text Biomedical Research Publications. Conference on Computational Linguistics 2016

7. Ihlow, F., Rödder, D., **Bochynek, T.**, Sothanin, S., Handschuh, M., and Böhme, W. (2014) – Reinforcement as a conservation toolassessing 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 *Atta*	ASSAB 2016
Costs and benefits of clearing physical trails in leaf-cutter ants *Atta*	Behaviour 2015
Dynamics of collective worksite selection in weaver ants	IUSSI 2014

Media Coverage

- nature Research Highlights: Ants build superhighways without bosses or blueprints
- ABC The Science Show: Leaf-cutter ants - the ultimate egalitarian workforce
- AFP: Construction without coordination: how ants build megaprojects

Awards & Scholarships

Northwestern University Centre for Leadership Fellowship (USD 1000)	2018
Monash University Postgraduate Publication Award (USD~3251)	2016
Faculty of IT Supplementary Funding Award, used for research visit (USD~3600)	2016
Best Student Presentation at ASSAB 2016 conference (signed textbook)	2016
Three Minute Thesis Competition faculty winner (USD~360)	2015
"Highly commended" poster at Monash IT Innovation Showcase	2015
Two national and one state price at GovHack Hackathon USD~1083)	2015
Monash International Postgrad Research Scholarship (USD~68,275)	2013
CSIRO Data61 / NICTA Top-up Scholarship (USD~17,700)	2013
Monash University Faculty Scholarship (USD~93,563)	2013

Total funds: USD~188,800

Skills

Programming languages: Python, Mathematica, Matlab, Java, C++, LaTeX

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

Professional Activities

- Reviewer for Behavioural Ecology and Sociobiology, 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 USD~50,670 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
- Four-time speaker at Monash PhD Student Induction Day; Presenter at Monash Univeristy Open Days and Innovation Showcases; Presenter at NICTA Tech Showcase
- Student Representative on Monash University academic conduct committees

Visited Institutions & Collaborators

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

Other Passions

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