

Manolis Chiou | CV

Research Fellow in Robotics
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Research Profile

I aim to develop AI for effective and fluent Human-Robot Teaming using the complementing competencies of robot AI and humans. My research is cross-disciplinary, drawing on methods from AI, robotics, human factors, and cognitive science. I emphasise application-driven research on Human-Robot Teaming and Human-Robot Interaction in safety-critical and hazardous environments via variable autonomy paradigms where humans collaborate with intelligent robots capable of dynamically self-regulating their level of autonomy.

Keywords: Human-Robot Teaming, Human-Robot Interaction, Variable Autonomy, Mixed-Initiative, Shared Control, robotics in hazardous environments

Employment

Research Fellow (Senior Postdoc) University of Birmingham Extreme Robotics Lab (PI: Rustam Stolkin) Leading the Human-Robot Teaming group Research in Variable Autonomy, Human-Robot Teaming, HRI	2020 – Present
Research Fellow (Postdoc) National Centre of Nuclear Robotics, University of Birmingham Extreme Robotics Lab (PI: Rustam Stolkin) Research in Variable Autonomy, Human-Robot Teaming, HRI	2018 – 2019
Research Scientist Greek Army Center of Informatics Part of conscript military service	2017 – 2018
Research Assistant University of Birmingham Extreme Robotics Lab (PI: Rustam Stolkin) Research in Variable Autonomy, Human-Robot Teaming, HRI	2017 (5 months)
Research Assistant School of Psychology, University of Birmingham, PI: Dietmar Heinke Research in Brain-Computer-Interfaces using EEG signals to move robots	2013 (6 months)

Education

PhD in Robotics University of Birmingham	2017
MSc in Computational Intelligence University of Sheffield	2012
BEng in Automation Engineering University of West Attica	2011

Teaching

Guest Lecturer Artificial Intelligence MSc joint course between departments University of West Attica	2018
Teaching Assistant Robot Programming undergraduate course School of Computer Science, University of Birmingham	2014 – 2017
Lead Organiser and Lecturer Robotics Hack Day one-day workshop School of Computer Science, University of Birmingham	2015

Supervision & Mentoring

PhD Students' Supervision Principal supervisor of 3 PhD students Co-supervisor (faculty): Prof. Rustam Stolkin	2020 – Present
Students, Interns, and Research Assistants Directly supervised 13 MSc and undergraduate students From the Uni. Of Birmingham and various institutions across the world Erasmus+, research visits, KONICOF internships Completed Internships, thesis, and research projects, both remotely and in person	2014 – Present
Leading the Birmingham Autonomous Robotics Club A robotics club where students were getting hands-on experience in using state-of-the-art robots. This was done through student projects, workshops, and participating in robotic competitions.	2014 – 2016

Grants

Nuclear Decommissioning Authority (NDA) 2023 PhD Bursaries	2023
<u>Title:</u> “Variable autonomy control paradigms applied to mobile manipulator decommissioning robots”	
<u>PI:</u> Prof. Rustam Stolkin	
<u>Role Manolis Chiou:</u> CO-I/Co-supervisor, co-author	
<u>Funding:</u> £93,750	
NCNR Flexible Partnership Funding	2019 – 2020
<u>Title:</u> “Haptic-guided shared control of mobile manipulation task”	
<u>PI:</u> Dr Amir Ghalamzan	
<u>Role Manolis Chiou:</u> CO-I, co-author	
<u>Funding:</u> £125,730	

Institutional Leadership & Citizenship (UoB)

Organising the Biweekly Extreme Robotics Lab seminars	2020 – 2022
Talks by internal and external prestigious speakers Brainstorming and discussion sessions	
PhD Assessment Panel Member (Regular)	2019 – Present
Assessing PhD students’ yearly progress as a formal requirement from the school and Extreme Robotics Lab	
Interview and Hiring Assessment Panel Member (Regular)	2019 – Present
Hiring of new postdoctoral researchers and PhD students in the Extreme Robotics Lab	
Owner and Maintainer of the Extreme Robotics Lab’s GitHub	2019 – Present
https://github.com/uob-erl	
Leading Ethics Applications	2018 – Present
Leading ethics applications to Uni. Of Birmingham ethics committee for the Extreme Robotics Lab projects that include human participants	
Line Manager for the Human-Robot Teaming Group	2018 – Present
Line manager, admin, and paperwork responsibilities Indicative responsibilities: liaising with admissions and graduate school, casual work paperwork and supervision, liaising for VISA checks, writing ATAS	

Academic Leadership & Service

Workshops

Lead organiser of the “Variable Autonomy for human-robot Teaming (VAT)” workshop at ACM/IEEE HRI 2023

Editing

Topic editor on “Variable Autonomy for Human-Robot Teaming”, Frontiers in Robotics and AI journal, 2023

Program Committee

AAMAS 2023, ECAI 2023

Conference Reviewing

AAMAS, IEEE/RSJ IROS, IEEE ICRA, ACM/IEEE HRI, IEEE SMC, IEEE ROMAN

Journal Reviewing

IEEE Robotics & Automation Letters, ACM Transactions on Human-Robot-Interaction, IEEE Transactions on Human-Machine Systems

Awards & Honours

Finalist, Best Paper Award in IEEE/RSJ IROS 2022

In safety, security, and rescue robotics category
Paper: “Robot-Assisted Nuclear Disaster Response: Report and Insights from a Field Exercise.”

Finalist, Best Paper Award in IEEE/RSJ IROS 2016

In cognitive robotics category
Paper “Experimental analysis of a variable autonomy framework for controlling a remotely operating mobile robot.”

Won RoCKIn@Home Robotics Challenge Prizes 2015

Leading Uni. of Birmingham robotics club
Best team in functionality benchmark “Object Perception”
Third overall place in the competition

Won RoCKIn@Home Robotics Challenge Prizes 2014

Leading Uni. of Birmingham robotics club
Best team in task benchmark “Getting to know my home”
Best team in task benchmark “Welcoming Visitors”
Second overall place in the competition

Invited Talks and Panels

“Meaningful Human Control in Human-Robot Teams” Invited talk and expert panellist at the “Trusted AI - the Future of Creating Ethical and Responsible AI systems” workshop organised by the consortium of European centres of excellence in AI.	2023
“Towards Transdisciplinary Human-Robot Teaming” Department of Computing Science, Umea University	2023
“Human-Robot Teaming in Remotely Operated Robotic Systems” Responsible AI group Department of Computing Science, Umea University	2022
“Towards Mixed-Initiative Control in Remotely Operated Robots” Cooperative Systems Group Institute of Control Systems, Karlsruhe Institute of Technology	2021
“Towards Robotic Systems that can Regulate their Autonomy Level” Frontiers of robotics research seminar series Lincoln Centre for Autonomous Systems Research, University of Lincoln	2019
“Variable Autonomy in Mobile Robots” Matsuno Lab School of Engineering, Kyoto University	2016

Outreach Activities

“Robot Lab Live” for UK Festival of Robotics Extreme Robotics Lab organiser and delivered one of the talks Live streaming showcasing labs across the UK by EPSRC UK Robotics and Autonomous Systems	2021
“Robotics masterclasses” for the Royal Institution of Great Britain Organised and delivered five talks and classes to teach and promote robotics and science in schools across the UK	2015 – 2016
Work Experience Workshops Organised and delivered two workshops to give high school students a taste of Computer Science. Hosted by the University of Birmingham.	2015 –2016
General Science Outreach Showcased robotics in a plethora of science outreach events Among others: I2fest; Athens Digital; University of Birmingham open days; BBC’s “Make it Digital” and others	2010 – Present

Selected Publications

- [J1] Ramesh, A., Stolkin, R., & **Chiou, M.** (2022). Robot Vitals and Robot Health: Towards Systematically Quantifying Runtime Performance Degradation in Robots Under Adverse Conditions. *IEEE Robotics and Automation Letters (RA-L)*, 7(4), 10729–10736. <https://doi.org/10.1109/LRA.2022.3192612>
- [J2] **Chiou, M.**, Hawes, N., & Stolkin, R. (2021). Mixed-initiative Variable Autonomy for Remotely Operated Mobile Robots. *ACM Transactions on Human-Robot Interaction(T-HRI)*, 10(4), 1–34. <https://doi.org/10.1145/3472206>
- [C1] Ramesh A., Braun C. A., Ruan, T., Rothfuß S., Hohmann S., Stolkin R., **Chiou M.** (2023). Experimental Evaluation of Model Predictive Mixed-Initiative Variable Autonomy Systems Applied to Human-Robot Teams. *IEEE International Conference on Systems, Man, and Cybernetics (SMC)*.
- [C2] **Chiou, M.**, Epsimos, G.-T., Nikolaou, G., Pappas, P., Petousakis, G., & Stefan, M. (2022). Robot-Assisted Nuclear Disaster Response: Report and Insights from a Field Exercise. *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. **Finalist, best paper award.** <https://doi.org/10.1109/IROS47612.2022.9981881>
- [C3] Rothfus, S., **Chiou, M.**, Inga, J., Hohmann, S., & Stolkin, R. (2022). A Negotiation-Theoretic Framework for Control Authority Transfer in Mixed-Initiative Robotic Systems. *IEEE International Conference on Systems, Man, and Cybernetics (SMC)*, 1, 921–928. <https://doi.org/10.1109/SMC53654.2022.9945196>
- [C4] Ruan, T., Wang, H., Stolkin, R., & **Chiou, M.** (2022). A Taxonomy of Semantic Information in Robot-Assisted Disaster Response. *IEEE International Symposium on Safety, Security, and Rescue Robotics (SSRR)*. <https://doi.org/10.1109/IROS47612.2022.9981881>
- [C5] Panagopoulos, D., Petousakis, G., Ramesh, A., Ruan, T., Nikolaou, G., Stolkin, R., & **Chiou, M.** (2022). A Hierarchical Variable Autonomy Mixed-Initiative Framework for Human-Robot Teaming in Mobile Robotics. *IEEE International Conference on Human-Machine Systems (ICHMS)*. <https://doi.org/10.1109/ICHMS56717.2022.9980686>
- [C6] Panagopoulos, D., Petousakis, G., Stolkin, R., Nikolaou, G., & **Chiou, M.** (2021). A Bayesian-Based Approach to Human Operator Intent Recognition in Remote Mobile Robot Navigation. *IEEE International Conference on Systems, Man, and Cybernetics (SMC)*, 125–131. <https://doi.org/10.1109/SMC52423.2021.9658942>
- [C7] Chatzithanos, P., Nikolaou, G., Stolkin, R., & **Chiou, M.** (2021). Fessonnia: A Method for Real-Time Estimation of Human Operator Workload Using Behavioural Entropy. *IEEE International Conference on Systems, Man, and Cybernetics (SMC)*, 1325–1331. <https://doi.org/10.1109/SMC52423.2021.9658880>
- [C8] **Chiou, M.**, McCabe, F., Grigoriou, M., & Stolkin, R. (2021). Trust, Shared Understanding and Locus of Control in Mixed-Initiative Robotic Systems. *IEEE International Conference on Robot & Human Interactive Communication (RO-MAN)*, 684–691. <https://doi.org/10.1109/RO-MAN50785.2021.9515476>

- [C9] **Chiou, M.**, Talha, M., & Stolkin, R. (2019). Learning effects in variable autonomy human-robot systems: how much training is enough? IEEE International Conference on Systems, Man and Cybernetics (SMC), 720–727.
<https://doi.org/10.1109/SMC.2019.8914558>
- [C10] **Chiou, M.**, Stolkin, R., Bieksaite, G., Hawes, N., Shapiro, K. L., & Harrison, T. S. (2016). Experimental analysis of a variable autonomy framework for controlling a remotely operating mobile robot. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 3581–3588.
<https://doi.org/10.1109/IROS.2016.7759527> **Finalist, best paper award.**