

MOHAMMAD DIVBAND SOORATI

Post-doctoral Research Fellow in Human-Swarm Teaming

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🔗 [Google Scholar](#)



EDUCATION & APPOINTMENTS

Post-doc in Human-Swarm Teaming

Project: Flexible Autonomy in Human-Swarm Interaction

Supervisor: Prof. Sarvapali Ramchurn

📅 August 2019 - Now

📍 University of Southampton, UK

Dr. Eng. in Computer Science (Robotics)

Thesis: Adaptivity and Self-Repair in Robot Self-Assembly

Supervisor: Prof. Heiko Hamann

📅 December 2019

📍 University of Lübeck, Germany

M.Sc. in Computer Science

Thesis: The Effect of Fitness Function Design on Performance in Evolutionary Robotics

Supervisor: Prof. Heiko Hamann

📅 April 2015

📍 Paderborn University, Germany

B.Sc. in Computer Engineering (Software)

Thesis: Calculation of Geometric Dilution of Precision using Adaptive Filtering Technique based on Evolutionary Algorithms

Supervisor: Prof. Mohammadreza Mosavi

📅 May 2010

📍 Iran University of Science & Technology, Iran

FUNDINGS & AWARDS

Alan Turing Fellowship

Post-doctoral researcher

Center for Machine Intelligence, directed by Prof. Dr. Sarvapali Ramchurn

📅 August 2019 - Now

📍 University of Southampton, UK

Research Fellowship

PhD student

Service Robotics Group, directed by Prof. Dr.-Ing. Heiko Hamann

📅 April 2017 - March 2019

📍 University of Lübeck, Germany

Research Fellowship

PhD student

Swarm Intelligence Group, directed by Prof. Dr.-Ing. Heiko Hamann

📅 August 2015 - March 2017

📍 Paderborn University, Germany

Research Assistantship

Semantic 3D mapping, intelligent exploration, and navigation for a robot in interior environment

GET Lab, directed by Prof. Bärbel Mertsching

📅 June 2012 - November 2013

📍 Paderborn University, Germany

Best Paper Award

30th Asian Conference on Remote Sensing (ACRS)

📅 October 2010

📍 Beijing, China

SYNERGISTIC ACTIVITIES

- 👥 Reviewer for Springer Journal on Swarm Intelligence
2020
- 👥 PC Member of the International Conference on Robotics and Automation (ICRA)
2020 & 2021
- 👥 PC Member of AAAI Conference on Artificial Intelligence (AAAI)
New York, 2021
- 👥 PC Member of the International Joint Conference on Artificial Intelligence (IJCAI)
Yokohama, 2020
- 👥 Co-organizer of the Alan Turing Workshop on Human-Swarm Teaming
London, 2019
- 👥 Co-founder of TERA Co. (A managed service provider)
Tehran, 2018
- 👥 PC Member of the International Conference on Adaptive and Self-Adaptive Systems and Applications (ADAPTIVE)
2018 - Now
- 👥 PC Member of the fourth IEEE International Conference on Knowledge-Based Engineering and Innovation (KBEI)
Tehran, 2017
- 👥 Co-organizer of ASSISIBf (EU-project) Winter School: From bio-inspired to bio-hybrid (robotic) systems
EPFL, Lausanne, 2016
- 👥 Mobile Application Product Manager (Recordium, reviewed as [App of the year](#))
2014

CO-SUPERVISED STUDENT PROJECTS

- PhD Projects:
 - Modeling trust in human-swarm teams, *Ashley Pare*, Oct 2020 - Now
 - Human-swarm interaction in environments with limited communication, *Thomas Kelly*, Sep 2020 - Now
- Master's Theses:
 - Embedded-Sensor Filaments for a Braided Exoskeleton: Sensing and Shape Recognition, *Bjarne Andresen*, Aug 2018
 - Binary Collective Decision-making with Long-term Adaptation System on Braided Compounds, *Zahra Nouri*, Jan 2017
- Bachelor's Theses:
 - 3D Model Reconstruction of Natural Plants Using 2D Low Resolution Imaging Sensors, *Ricardo Stolze*, Oct 2018
 - Diffusion-limited aggregation on a simulated swarm of robots using BEECLUST algorithm, *Marcus Nachtigall*, Feb 2016
- Student Group Projects:
 - Florentina: Robot-Plant Bio-Hybrid System, a group project with 12 masters students, Apr 2015 - Apr 2016
 - Actuating artificial muscles using NeuroEvolution of Augmented Topologies, 3 students, Jan 2018 - May 2018
 - Phototactic Behaviour using Artificial Muscles, 2 students, Jan 2019 - Jun 2019
- Interns
 - Alexandru Patrick Pop, University of Southampton, Nov 2020 - Now
 - Dimitar Georgiev, University of Southampton, Sep 2019 - Apr 2020
 - James Williams, Northwestern University, Jul 2018 - Sep 2018
 - Marco Mora-Mendoza, Stanford University, Jul 2018 - Sep 2018

PUBLICATIONS

Human-Swarm Teaming with Proximal Interactions, [\[↓\]](#)

Mohammad Divband Soorati, Dimitar Georgiev, Javad Ghofrani, Danesh Tarapore, Sarvapali Ramchurn
International Conference on Swarm Intelligence (ANTS)

📅 October 2020

📍 Barcelona, Spain

Repository for Reusing Artifacts of Artificial Neural Networks, [\[↓\]](#)

Javad Ghofrani, Ehsan Kozegar, Mohammad Divband Soorati, Arezoo Bozorgmehr, Hongfei Chen, Maximilian Naake
arXiv preprint arXiv:2003.13619

📅 March 2020

Plasticity in Collective Decision-Making for Robots: Creating Global Reference Frames, Detecting Dynamic Environments, and Preventing Lock-ins [\[↓\]](#)

Mohammad Divband Soorati, Maximilian Krome, Marco Mora-Mendoza, Javad Ghofrani, Heiko Hamann
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)

📅 November 2019

📍 Macau, China

Photomorphogenesis for Robot Self-assembly: Adaptivity, Collective Decision-making, and Self-repair [\[↓\]](#)

Mohammad Divband Soorati, Mary Katherine Heinrich, Javad Ghofrani, Payam Zahadat, Heiko Hamann
Bioinspiration & Biomimetics Journal (BB-IOP)

📅 June 2019

Constructing Living Buildings: A Review of Relevant Technologies for a Novel Application of Biohybrid Robotics [\[↓\]](#)

Mary Katherine Heinrich, Sebastian von Mammen, Daniel Nicolas Hofstadler, Mostafa Wahby, Payam Zahadat, Tomasz Skrzypczak, Mohammad Divband Soorati et al.

Journal of The Royal Society Interface

📅 June 2019

Reusability in Artificial Neural Networks: an Empirical Study [\[↓\]](#)

Javad Ghofrani, Ehsan Kozegar, Arezoo Bozorgmehr, Mohammad Divband Soorati
Workshop on Experiences and Empirical Studies on Software Reuse (WEESR)

📅 September 2019

📍 Paris, France

Applying Product Line Engineering Concepts to Deep Neural Networks [\[↓\]](#)

Javad Ghofrani, Ehsan Kozegar, Anna Lena Fehlhaber, Mohammad Divband Soorati
Systems and Software Product Line Conference (SPLC)

📅 September 2019

📍 Paris, France

Swarm Robotics: Robustness, Scalability, and Self-X Features in Applications [\[↓\]](#)

Mary Katherine Heinrich, Mohammad Divband Soorati, Tanja Katharina Kaiser, Mostafa Wahby, Heiko Hamann
De Gruyter Online Journal

📅 January 2019

Adaptive Path Formation in Self-Assembling Robot Swarms by Tree-like Vascular Morphogenesis [\[↓\]](#)

[Mohammad Divband Soorati](#), Javad Ghofrani, Payam Zahadat, Heiko Hamann
International Symposium on Distributed Autonomous Robotic Systems (DARS)

📅 October 2018

📍 Boulder, USA

Robust and Adaptive Robot Self-Assembly Based on Vascular Morphogenesis [\[↓\]](#)

[Mohammad Divband Soorati](#), Javad Ghofrani, Payam Zahadat, Heiko Hamann
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)

📅 October 2018

📍 Madrid, Spain

Flora robotica—An Architectural System Combining Living Natural Plants and Distributed Robots [\[↓\]](#)

Heiko Hamann, [Mohammad Divband Soorati](#), et al.

arXiv preprint arXiv:1709.04291

📅 September 2017

Robot Self-Assembly as Adaptive Growth Process: Collective Selection of Seed Position and Self-Organizing Tree-Structures [\[↓\]](#)

[Mohammad Divband Soorati](#), Heiko Hamann

IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)

📅 October 2016

📍 Daejeon, South Korea

Self-Organized Construction with Continuous Building Material: Higher Flexibility based on Braided Structures [\[↓\]](#)

Mary Katherine Heinrich, Mostafa Wahby, [Mohammad Divband Soorati](#), Daniel Nicolas Hofstadler, Payam Zahadat, Phil Ayres, Kasper Støy, Heiko Hamann

IEEE International Workshop on Self-Organising Construction (SOCO)

📅 September 2016

📍 Augsburg, Germany

Hybrid Societies: Challenges and Perspectives in the Design of Collective Behavior in Self-organizing Systems [\[↓\]](#)

Heiko Hamann, Yara Khaluf, Jean Botev, [Mohammad Divband Soorati](#), et al.

Frontiers in Robotics and AI, section Computational Intelligence

📅 April 2016

Evolution of Controllers for Robot-Plant Bio-Hybrids: A Simple Case Study Using a Model of Plant Growth and Motion [\[↓\]](#)

Mostafa Wahby, [Mohammad Divband Soorati](#), Sebastian von Mammen, Heiko Hamann

Proceedings of the 25th Workshop on Computational Intelligence

📅 November 2015

📍 Dortmund, Germany

The Effect of Fitness Function Design on Performance in Evolutionary Robotics: The Influence of *a priori* Knowledge [\[↓\]](#)

[Mohammad Divband Soorati](#), Heiko Hamann

Genetic and Evolutionary Computation Conference (GECCO)

📅 July 2015

📍 Madrid, Spain

Automatic Reconstruction of Polygonal Room Models from 3D Point Clouds

Tobias Kotthaus, [Mohammad Divband Soorati](#), Baerbel Mertsching

IEEE International Conference on Robotics and Biomimetics (ROBIO)

 December 2013

 Shenzhen, China

Ca-re-chord: A Churn Resistant Self-Stabilizing Chord Overlay Network

Markus Benter, [Mohammad Divband Soorati](#), Sebastian Kniesburges, Andreas Koutsopoulos, Kalman Graffi

IEEE Conference on Networked Systems (NetSys)

 March 2011

 Stuttgart, Germany

A Comparison of Particle Swarm Optimization and Gradient Descent in training Wavelet Neural Network to Predict DGPS Corrections

[Mohammad Divband Soorati](#)

Proceedings of the World Congress on Engineering and Computer Science (WCECS)

 October 2010

 Berkeley, USA

Calculation of Geometric Dilution of Precision using Adaptive Filtering Technique based on Evolutionary Algorithms

Mohammadreza Mosavi, [Mohammad Divband Soorati](#)

IEEE International Conference on Electrical and Control Engineering (ICECE)

 June 2010

 Wuhan, China

DGPS Corrections Approximation using Evolutionary Algorithms

Mohammadreza Mosavi, Hamid Amirmoini, Maryam Sorkhi, [Mohammad Divband Soorati](#)

National Conference on GIS (Persian)

 November 2009

 Tehran, Iran

Errors Prediction in GPS Low Cost Users using Wavelet Neural Network Trained by a PSO Algorithm

Mohammadreza Mosavi, [Mohammad Divband Soorati](#)

3rd National Conference on Data mining (Persian)

 November 2009

 Tehran, Iran

GPS Timing Errors Modelling in Frequency Domain

Mohammadreza Mosavi, [Mohammad Divband Soorati](#)

Proceedings of the Asian Conference on Remote Sensing (ACRS)

 October 2009

 Beijing, China