

# Marija Popović

## Curriculum Vitae

Niebuhrstraße 1A  
53113 Bonn

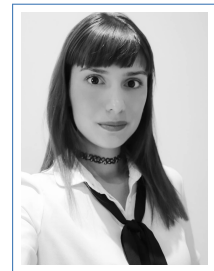
+49-15-20-58-43-511

Skype: masha.popovic

Twitter: @mashapopovic

✉ mpopovic@uni-bonn.de

mpopovic.io



---

**Current Position:** *Junior Research Group Leader*, Cluster of Excellence “PhenoRob”, University of Bonn, Germany

---

Date of Birth 14.05.1993 Place of Birth Belgrade, Serbia  
Citizenship Serbian Marital Status Single

[in LinkedIn](#) | [GitHub](#) | [Google Scholar](#) | [ResearchGate](#)

Research Interests Active decision-making, planning/coordination, and computer vision for aerial and ground vehicles, with applications in agriculture and inspection robotics.

---

## Education

- Sep 2015 - **Doctor of Philosophy**, *Autonomous Systems Lab*, ETH Zürich, Switzerland
- Oct 2019 ○ Ph.D. Thesis: Environmental Mapping and Informative Path Planning for UAV-based Active Sensing
- Oct 2011 - **Master in Engineering in Integrated Mechanical & Electrical Engineering (IMEE)**,  
Jun 2015 *Department of Electrical & Electronic Engineering*, University of Bath, UK  
Top graduate with first-class honors (88.14% overall)
  - Final Year Project: Genetic Algorithm-based Optimisation for Non-linear Systems
  - Group Business & Design Project: Avionics Design for a UAV in Search and Rescue
- Jun 2013 - **Science & Engineering Summer Experience (SENSE)**,  
Aug 2013 *Technische Universität Braunschweig*, Braunschweig, Germany  
Research assistant and summer exchange student (1.0+ overall)
- Sep 2008 - **International Baccalaureate Diploma Programme (IBDP)**,  
Jun 2011 *American International School in Abu Dhabi*, Abu Dhabi, UAE  
Top graduate with honors (44 points overall)
  - 7, 7, 6 points in Higher Level subjects Physics, Mathematics, and Chemistry

---

## Professional and Academic Experience

- Feb 2021 - **Junior Research Group Leader**, *Cluster of Excellence “PhenoRob”*, University of Bonn, Germany  
Present
  - Leading research group (2 PhD students) in Core Project 4 *Autonomous In-Field Intervention*
- Dec 2019 - **Research Associate**, *Smart Robotics Lab*, Imperial College London, UK
- Feb 2021
  - Dec 2019 - Feb 2021: Member of EPSRC-funded Project *Aerial Additive Building Manufacturing*
    - Four-year project aiming to develop an aerial robotic construction system
  - Dec 2019 - Feb 2021: Member of EPSRC/Orca Hub-funded Project *SWIFT*
    - One-year project aiming to develop real-time visual robotic mapping and inspection
- Sep 2015 - **Scientific Researcher and Teaching Assistant**, *Autonomous Systems Lab*, ETH Zürich, Switzerland
- Oct 2019
  - Jan 2019 - Apr 2019: Visiting researcher at the *Centre for Autonomous Systems*, UTS, Australia
    - Research on active sensing under localisation uncertainty
  - Apr 2015 - Sep 2018: Member of EU-Horizon 2020 Project *Flourish* (UAV navigation)
    - Three-year project aiming to develop an adaptable robotic solution for precision agriculture
  - Nov 2016 - Mar 2017: Participant in the *Mohamed Bin Zayed International Robotic Challenge*
    - Biannual robotics competition in Abu Dhabi with total prize money of US \$5M
  - Supervisor of Master (6) and Semester (2) student projects
- Oct 2015 - **IB Tutor**, *Yashina Tutors*, Switzerland
- Jul 2019 Active tutor for HL/SL Maths and Physics.
- Jun 2014 - **DAAD Research Internships in Science & Engineering (RISE) Intern**,  
Aug 2014 *Universität Bremen*, Bremen, Germany  
Research assistant in Group of Computer Architecture & Group of Reliable Embedded Systems.

---

## Citation Indices

h-index: 13 | i10-index: 14 | Number of citations: 655 | determined via [Google Scholar](#) on Nov 22

---

## Honors and Awards

- 2017 Two second places in the *Mohamed Bin Zayed International Robotic Challenge* (Challenges 3 and Grand Challenge) as team member
- 2015 Moog International Woman in Engineering Prize, UK
- 2015 M&W Prize for Best Interdisciplinary Engineering Project, UK
- 2015 M&W Prize for Best Final Year IMEE Student, UK
- 2014 - 2015 Elected Departmental Staff-Student Liaison Committee (SSLC) Student Chair, UK
- 2012 - 2015 Elected SSLC IMEE Academic Representative (3 years), UK
- 2013 BP Centurion Award, UK
- 2011 IBDP Valedictorian of 2011 graduating class, UAE
- 2011 IBDP Honors Award, UAE

---

## Research Grants

- 2021 *Argelander Starter-Kit Grant for Postdocs*, awarded to excellent early-career researchers (€13,700)

---

## Teaching Experience

- Spring 2021 **Module Leader, Decision-Making for Autonomous Robots**, University of Bonn, Germany  
MSc course, introduced and organised new module, lecturing 2 hours/week.
- Spring 2020 **Teaching Assistant, Advanced Robotics**, Imperial College, UK  
MEng/MSc course, 4 hours/week, substitute lecturing for Dr. Leutenegger, project supervision. [\[Link\]](#)
- Spring 2018 **Teaching Assistant, Perception and Learning for Robotics**, ETH Zürich, Switzerland  
BSc/MSc course (non-recurring), project supervision. [\[Link\]](#)
- Autumn 2016, **Teaching Assistant, Robot Dynamics**, ETH Zürich, Switzerland  
2017, 2018 BSc/MSc course. [\[Link\]](#)
- Spring 2017, **Teaching Assistant, Autonomous Mobile Robots**, ETH Zürich, Switzerland  
2018 BSc/MSc course. [\[Link\]](#)

---

## Online Teaching Examples (YouTube)

- 2021 **Decision-Making for Autonomous Robots: What is Planning?** - <https://youtu.be/M71-2VtXbXM>
- 2021 **Decision-Making for Autonomous Robots: Reinforcement Learning** - <https://youtu.be/wqZ7xeXFtWI>
- 2021 **Decision-Making for Autonomous Robots: Informative Planning** - <https://youtu.be/3w5YIYN-y8o>

---

## Invited Talks

- Aug 2021 IEEE RAS Technical Committee on Agricultural Robotics and Automation Society (online)
- May 2021 "PhenoRob" Women in Science Series (online)
- Sep 2020 University of Bonn, DE
- Jul 2020 University of Michigan, USA (online)
- Jul 2019 Imperial College London, UK
- Jul 2019 University of Oregon, USA (online)
- Jan 2019 University of Technology, Sydney, AUS
- Feb 2015 ETH Zurich, Zürich, Switzerland

---

## Professional Positions and Memberships

**Junior Co-chair** of the IEEE RAS Technical Committee on Agricultural Robotics and Automation (2021-present).  
**Member** of the IEEE, IEEE Robotics & Automation Society, IEEE Women in Engineering Society, and Women in AI Society.

---

## Services for Journals

**Associate Editor** for journal *IEEE Robotics and Automation Letters* (2021-present).

**Guest Editor** for Field Robotics section of journal *Remote Sensing* for the special issue on Applications of Remote Data Capture Systems in Agriculture and Vegetation (2021).

**Associate Editor** for Field Robotics section of journal *Frontiers in Robotics and AI* (2020).

**Reviewer:** *IEEE Robotics and Automation Letters* 2018-22; *Science Robotics* 2020; *Remote Sensing* 2020; *IEEE Transactions on Robotics* 2019; 2021; *Autonomous Robots* 2019; *Jour. of Field Robotics* 2018; *IEEE Access* 2018.

---

## Services for Conferences

**Main Organiser** of Workshop on Agricultural Robotics and Automation. *European Conf. on Mobile Robots* (2021).

**Program Committee Member** of 2nd Workshop on Informative Path Planning and Adaptive Sampling. *Robotics: Science and Systems* (2019).

**Reviewer:** *European Conf. on Mobile Robots* 2021; *IEEE Int. Conf. on Robotics and Automation* 2016; 2018-22; *IEEE/RSJ Int. Conf. on Intelligent Robots and Systems* 2017-21; *IEEE Conf. on Control Tech. and Applications* 2020; *Robotics: Science and Systems* 2018-19; 2021; *IEEE Int. Conf. on Advanced Robotics and Mechatronics* 2018; *IEEE Int. Symp. on Safety, Security, and Rescue Robotics* 2016; *Int. Joint Conf. on Artificial Intelligence* 2016.

---

## Outreach and Other Activities

Participant in IEEE RAS Women in Engineering summer mentoring event (2020).

Media coverage: [EU Grants Science Stories article on Project Flourish](#) (2019).

---

## Languages

Serbian Native proficiency

English Bilingual proficiency  
◦ IELTS (2010)

German Full professional proficiency  
◦ Goethe-Zertifikat B2 (Sep 2012)  
◦ Swiss German course C1-C2 (Sep 2015 - Dec 2015)

French Limited working proficiency  
◦ DELF A2 (Nov 2007)  
◦ Individual tutoring B1

Spanish Limited working proficiency  
◦ A2 course (Sep 2016 - Dec 2016)

---

## Publication List

### Peer-Reviewed Journal/Magazine Articles

- [J9] **M. Popović\***, F. Thomas\*, S. Papatheodorou, N. Funk, T. Vidal-Calleja, S. Leutenegger. "Volumetric Occupancy Mapping With Probabilistic Depth Completion for Robotic Navigation". In: *IEEE Robotics and Automation Letters*. IEEE, 2021. 6(3). [[pdf](#)]
- [J8] N. Funk, J. Tarrío, S. Papatheodorou, **M. Popović**, P. F. Alcántarilla, S. Leutenegger. "Multi-Resolution 3D Mapping with Explicit Free Space Representation for Fast and Accurate Mobile Robot Motion Planning". In: *IEEE Robotics and Automation Letters*. IEEE, 2021. 6(2): pp.3553-3560. [[pdf](#)]
- [J7] A. Pretto, S. Aravecchia, W. Burgard, N. Chebrou, C. Dornhege, T. Falck, F. Fleckenstein, A. Fontenla, M. Imperoli, R. Khanna, F. Liebisch, P. Lottes, A. Milioto, D. Nardi, S. Nardi, J. Pfeifer, **M. Popović**, C. Potena, C. Pradalier, E. Rothacker-Feder, I. Sa, A. Schaefer, R. Siegwart, C. Stachniss, A. Walter, V. Winterhalter, X. Wu, J. Nieto. "Building an Aerial-Ground Robotics System for Precision Farming". In: *IEEE Robotics and Automation Magazine*. IEEE, 2020. In press.
- [J6] **M. Popović**, T. Vidal-Calleja, G. Hitz, J. J. Chung, I. Sa, R. Siegwart, J. Nieto. "An informative path planning framework for UAV-based terrain monitoring". In: *Autonomous Robots*. Springer, 2020. pp.889-911. [[pdf](#)]
- [J5] M. Faria, R. Marín, **M. Popović**, A. Millane, R. Siegwart. "Efficient Lazy Theta\* Path Planning over a Sparse Grid to Explore Large 3D Volumes with a Multicopter UAV". In: *Sensors*. MDPI, 2019. 19(1). [[pdf](#)]
- [J4] R. Bähnamann, M. Pantic, **M. Popović**, D. Schindler, M. Tranzatto, M. Kamel, M. Grimm, J. Widauer, R. Siegwart, J. Nieto. "The ETH-MAV Team in the MBZ International Robotics Challenge". In: *Jour. of Field Robotics*. Wiley Periodicals, 2019. [[arXiv](#)]
- [J3] I. Sa, M. Kamel, M. Burri, M. Bloesch, R. Khanna, **M. Popović**, J. Nieto, R. Siegwart. "Build Your Own Visual-Inertial Drone: A Cost-Effective and Open-Source Autonomous Drone". In: *IEEE Robotics and Automation Magazine*. IEEE, 2018. pp.89-103. [[pdf](#)]
- [J2] I. Sa, **M. Popović**, R. Khanna, Z. Chen, P. Lottes, F. Liebisch, J. Nieto, C. Stachniss, A. Walter, R. Siegwart. "WeedMap: A Large-Scale Semantic Weed Mapping Framework Using Aerial Multispectral Imaging and Deep Neural Network for Precision Farming". In: *Remote Sensing*. MDPI, 2018. 10(3). [[pdf](#)]
- [J1] I. Sa, Z. Chen, **M. Popović**, R. Khanna, F. Liebisch, J. Nieto, R. Siegwart. "weedNet: Dense Semantic Weed Classification Using Multispectral Images and MAV for Smart Farming". In: *IEEE Robotics and Automation Letters*. IEEE, 2018. 3(1): pp.588-595. [[pdf](#)]

### Peer-Reviewed Conference Papers

- [C16] L. Jin, J. Rückin, S. Kiss, T. Vidal-Calleja, **M. Popović**. "Adaptive-Resolution Gaussian Process Mapping for Efficient UAV-based Terrain Monitoring". In: *IEEE Int. Conf. on Robotics and Automation*. 2021. Under review. [[arXiv](#)]

- [C15] J. Rückin, L. Jin, **M. Popović**. “Adaptive Informative Path Planning Using Deep Reinforcement Learning for UAV-based Active Sensing”. In: *IEEE Int. Conf. on Robotics and Automation*. 2021. Under review. [[arXiv](#)]
- [C14] Y. Tao, **M. Popović**, Y. Wang N. Chebrolo, M. Fallon. “3D Lidar Reconstruction with Probabilistic Depth Completion for Robotic Navigation”. In: *IEEE Int. Conf. on Robotics and Automation*. 2021. Under review.
- [C13] F. Stache\*, J. Westheider\*, F. Magistri, **M. Popović**, C. Stachniss. “Adaptive Path Planning for UAV-based Multi-Resolution Semantic Segmentation”. In: *European Conf. on Mobile Robots*. IEEE, 2021. [[arXiv](#)]
- [C12] Y. Wang, N. Funk, M. Ramezani, S. Papatheodorou, **M. Popović**, M. Camurri, S. Leutenegger, M. Fallon. “Elastic and Efficient LiDAR Reconstruction for Large-Scale Exploration Tasks”. In: *IEEE Int. Conf. on Robotics and Automation*. IEEE, 2021. [[arXiv](#)]
- [C11] D. Tzoumanikas, F. Graule, Q. Yan, D. Shah, **M. Popović**, S. Leutenegger. “Aerial Manipulation Using Hybrid Force and Position NMPC Applied to Aerial Writing”. In: *Robotics: Science and Systems*. MIT Press, 2020. [[pdf](#)]
- [C10] **M. Popović**, T. Vidal-Calleja, J. J. Chung, J. Nieto, R. Siegwart. “Informative Path Planning and Mapping for Active Sensing Under Localization Uncertainty”. In: *IEEE Int. Conf. on Robotics and Automation*. IEEE, 2020. Accepted. [[arXiv](#)]
- [C9] A. A. Meera, **M. Popović**, A. Millane, R. Siegwart. “Obstacle-aware Adaptive Informative Path Planning for UAV-based Target Search”. In: *IEEE Int. Conf. on Robotics and Automation*. Montréal, QC: IEEE, 2019. [[pdf](#)]
- [C8] F. Causa, **M. Popović**, G. Fasano, M. Grassi, J. Nieto, R. Siegwart. “Navigation aware planning for tandem UAV missions in GNSS challenging environments”. In: *AIAA Science and Technology Forum and Exposition*. San Diego: AIAA, 2019. [[pdf](#)]
- [C7] M. Longhi, Z. Taylor, **M. Popović**, J. Nieto., R. Siegwart, G. Marrocco. “RFID-Based Localization for Greenhouses Monitoring Using MAVs”. In: *Int. Conf. on Electromagnetics in Advanced Applications*. Cartagena: IEEE, 2018. [[pdf](#)]
- [C6] T. Miki, **M. Popović**, A. Gawel, G. Hitz., R. Siegwart. “Multi-agent Time-based Decision-making for the Search and Action Problem”. In: *IEEE Int. Conf. on Robotics and Automation*. Brisbane: IEEE, 2018. pp.2365-2372. [[pdf](#)]
- [C5] **M. Popović**, T. Vidal-Calleja, G. Hitz, I. Sa, R. Siegwart, J. Nieto. “Multiresolution Mapping and Informative Path Planning for UAV-based Terrain Monitoring”. In: *IEEE/RSJ Int. Conf. on Intelligent Robots and Systems*. Vancouver: IEEE, 2017. pp.1382-1388. [[pdf](#)]
- [C4] I. Sa, M. Kamel, R. Khanna, **M. Popović**, J. Nieto, R. Siegwart. “Dynamic System Identification, and Control for a Cost-Effective and Open-Source Multi-rotor MAV”. In: *Field and Service Robotics*. Zürich: Springer, 2017. pp.605-620. [[pdf](#)]
- [C3] A. R. Vetrella, I. Sa, **M. Popović**, R. Khanna, J. Nieto, G. Fasano, D. Accardo, R. Siegwart. “Improved Tau-Guidance and Vision-Aided Navigation for Robust Autonomous Landing of UAVs”. In: *Field and Service Robotics*. Zürich: Springer, 2017. pp.115-128. [[pdf](#)]
- [C2] **M. Popović**, G. Hitz, J. Nieto, I. Sa, R. Siegwart, E. Galceran. “Online Informative Path Planning for Active Classification Using UAVs”. In: *IEEE Int. Conf. on Robotics and Automation*. Singapore: IEEE, 2017. pp.5753-5758. [[pdf](#)]
- [C1] J. Pfeifer, R. Khanna, D. Constantin, **M. Popović**, E. Galceran, N. Kirchgessner, A. Walter, R. Siegwart, F. Liebisch. “Towards automatic UAV data interpretation for precision farming”. In: *Int. Conf. of Agricultural Engineering*, 2016. [[pdf](#)]

### Peer-Reviewed Workshop Papers

- [W2] H. Blum, S. Rohrbach, **M. Popović**, L. Bartolomei, R. Siegwart. “Active Learning for UAV-based Semantic Mapping”. In: *2nd Workshop on Informative Path Planning and Adaptive Sampling, Robotics: Science and Systems*. MIT Press, 2019.
- [W1] F. Liebisch, **M. Popović**, J. Pfeifer, R. Khanna, P. Lottes, C. Stanchiss, A. Pretto, I. Sa, J. Nieto, R. Siegwart, A. Walter. “Automatic UAV-based field inspection campaigns for weeding in row crops” [abstract]. In: *10th EARSel SIG Imaging Spectroscopy Workshop*. Zürich, 2017.

### Invited Articles

- [A1] **M. Popović**. “Counting penguins with drones”. In: *Science Robotics*. AAAS, 2020. 5(47). [[pdf](#)]

### Book Chapters

- [B1] C. Papachristos, M. Kamel, **M. Popović**, S. Khattak, A. Bircher, H. Oleynikova, T. Dang, F. Mascarich, K. Alexis, R. Siegwart. “Autonomous Exploration and Inspection Path Planning for Aerial Robots Using the Robot Operating System”. In: *Robot Operating System (Vol. 3)*. Springer, 2018. pp.67-111. [[pdf](#)]

### Theses

- [T1] **M. Popović**. “Environmental Mapping and Informative Path Planning for UAV-based Active Sensing”. Ph.D. thesis, ETH Zürich, Department of Mechanical and Process Engineering, 2019. [[pdf](#)]

### Presentations

- [P1] **M. Popović**. “An Informative Path Planning (IPP) Framework for UAV-based Terrain Monitoring”. In: International Conference on Digital Technologies for Sustainable Crop Production (DIGICROP) (online). 2020. [[Link](#)]

### Not Peer-Reviewed Publications

- [N1] H. S. Ahn, F. Dayoub, **M. Popović**, B. MacDonald, R. Siegwart, I. Sa. “An Overview of Perception Methods for Horticultural Robots: From Pollination to Harvest”. In: *arXiv*, 2018. [[pdf](#)]