



Viktor Walter

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Department of Cybernetics
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Google Scholar

Born 7 November 1992
Speaks Slovak (native), English (C1), French (B1)

EDUCATION

March 2025 –
February 2026

Post-doctoral research

Work in the Robotics Institute of the Carnegie-Mellon University
Head of the Laboratory: Dr. Sebastian Scherer

September 2016 –
June 2024

PhD in Electrical Engineering and Information Technology at FEE CTU

Dissertation topic: Visual Relative Localization and Stabilization of Cooperating Unmanned Helicopters
Supervisor: doc. Ing. Martin Saska, Dr. rer. nat.

November 2017 –
December 2017

Laboratory for Analysis and Architecture of Systems, Toulouse

First internship in RIS group headed by Antonio Franchi

October 2018 –
December 2018

Laboratory for Analysis and Architecture of Systems, Toulouse

Second internship in RIS group headed by Antonio Franchi

September 2014 –
June 2016

Master's degree in Cybernetics, Control and Measurements at FEEC BTU

Master's thesis topic: Projection of Data into a Scene

September 2014 –
December 2014

Aalto University, Finland

One semester-long Erasmus Exchange Programme

September 2011 –
June 2014

Bachelor's degree in Automation and Measurement at FEEC BTU

Bachelor's thesis: QR and Barcodes

ACHIEVEMENTS

February 2020

Winners of MBZIRC 2020 Competition

Second place in Challenge 1 – cooperative 3D targets capture.
First place in Challenge 2 – cooperative building of brick wall.
Fourth place in Challenge 3 – cooperative fire extinguishing.
First place in Grand challenge – combination of all previous challenges.

October 2025

Year 2 Event of DARPA Triage Challenge

Sixth place – Qualified for participation in Year 3

ACADEMIC RECORD

Publication count
Citations
Teaching

Journal: 8, Conference: 8
Google Scholar: 1021, h-index: 14; Web of Science (WoS): 287, h-index: 10
Algorithms – exercises

Impacted journals

- [1] Hert, D., Baca, T., Petracek, P., Kratky, V., Penicka, R., Spurny, V., Petrlik, M., Vrba, M., Zaitlik, D., Stoudek, P., **Walter, V.**, Stepan, P., Horyna, J., Pritzl, V., Sramek, M., Ahmad, A., Silano, G., Bonilla Licea, D., Stibinger, P., Nascimento, T., Saska, M. "MRS Drone: A Modular Platform for Real-World Deployment of Aerial Multi-Robot Systems". In: *Journal of Intelligent & Robotic Systems* 108 (64 July 2023), pp. 1–34.
- [2] Horyna, J., Baca, T., **Walter, V.**, Albani, D., Hert, D., Ferrante, E., Saska, M. "Decentralized swarms of unmanned aerial vehicles for search and rescue operations without explicit communication". In: *Autonomous Robots* (2022), pp. 1–17.
- [3] **Walter, V.**, Spurny, V., Petrlik, M., Baca, T., Zaitlik, D., Demkiv, L., Saska, M. "Extinguishing real fires by fully autonomous multirotor UAVs in the MBZIRC 2020 competition". In: *Field Robotics* 2 (Apr. 2022), pp. 406–436. issn: 2771-3989.
- [4] Jindal, K., Wang, A., Thakur, D., Zhou, A., Spurny, V., **Walter, V.**, Broughton, G., Krajnik, T., Saska, M., Loianno, G. "Design and Deployment of an Autonomous Unmanned Ground Vehicle for Urban Firefighting Scenarios". In: *Field Robotics* 1 (2021), pp. 186–202.
- [5] Novak, F., **Walter, V.**, Petracek, P., Baca, T., Saska, M. "Fast collective evasion in self-localized swarms of unmanned aerial vehicles". In: *Bioinspiration & Biomimetics* 16.6 (Nov. 2021), p. 066025.
- [6] Spurny, V., Pritzl, V., **Walter, V.**, Petrlik, M., Baca, T., Stepan, P., Zaitlik, D., Saska, M. "Autonomous Firefighting Inside Buildings by an Unmanned Aerial Vehicle". In: *IEEE Access* 9 (Jan. 2021), pp. 15872–15890.
- [7] Petracek, P., **Walter, V.**, Baca, T., Saska, M. "Bio-Inspired Compact Swarms of Unmanned Aerial Vehicles without Communication and External Localization". In: *Bioinspiration & Biomimetics* 16.2 (Dec. 2020), p. 026009.
- [8] **Walter, V.**, Staub, N., Franchi, A., Saska, M. "UVDAR System for Visual Relative Localization With Application to Leader–Follower Formations of Multirotor UAVs". In: *IEEE Robotics and Automation Letters* 4.3 (July 2019), pp. 2637–2644. issn: 2377-3766.

Conference proceedings

- [1] Hert, D., Baca, T., Petracek, P., Kratky, V., Spurny, V., Petrlik, M., Vrba, M., Zaitlik, D., Stoudek, P., **Walter, V.**, Stepan, P., Horyna, J., Pritzl, V., Silano, G., Bonilla Licea, D., Stibinger, P., Penicka, R., Nascimento, T., Saska, M. "MRS Modular UAV Hardware Platforms for Supporting Research in Real-World Outdoor and Indoor Environments". In: *2022 International Conference on Unmanned Aircraft Systems (ICUAS)*. IEEE. June 2022, pp. 1264–1273.
- [2] Horyna, J., **Walter, V.**, Saska, M. "UVDAR-COM: UV-Based Relative Localization of UAVs with Integrated Optical Communication". In: *2022 International Conference on Unmanned Aircraft Systems (ICUAS)*. IEEE. June 2022.
- [3] Ahmad, A., **Walter, V.**, Petracek, P., Petrlik, M., Baca, T., Zaitlik, D., Saska, M. "Autonomous Aerial Swarming in GNSS-denied Environments with High Obstacle Density". In: *2021 IEEE International Conference on Robotics and Automation (ICRA)*. IEEE. June 2021, pp. 570–576.
- [4] **Walter, V.**, Spurny, V., Petrlik, M., Baca, T., Zaitlik, D., Saska, M. "Extinguishing of Ground Fires by Fully Autonomous UAVs Motivated by the MBZIRC 2020 Competition". In: *2021 International Conference on Unmanned Aircraft Systems (ICUAS)*. IEEE. June 2021, pp. 787–793.
- [5] **Walter, V.**, Vrba, M., Saska, M. "On training datasets for machine learning-based visual relative localization of micro-scale UAVs". In: *2020 IEEE International Conference on Robotics and Automation (ICRA)*. Aug. 2020, pp. 10674–10680.
- [6] **Walter, V.**, N.Staub, Saska, M., Franchi, A. "Mutual Localization of UAVs based on Blinking Ultraviolet Markers and 3D Time-Position Hough Transform". In: *14th IEEE International Conference on Automation Science and Engineering (CASE 2018)*. 2018.
- [7] **Walter, V.**, Novak, T., Saska, M. "Self-localization of Unmanned Aerial Vehicles Based on Optical Flow in Onboard Camera Images". In: *Lecture Notes in Computer Science, vol 10756*. Cham: Springer International Publishing, 2018.
- [8] **Walter, V.**, Saska, M., Franchi, A. "Fast mutual relative localization of uavs using ultraviolet led markers". In: *2018 International Conference on Unmanned Aircraft System (ICUAS 2018)*. 2018.

Submitted works under review

- [1] Licea, D. B., **Walter, V.**, Ghogho, M., Saska, M. "Optical communication-based identification for multi-UAV systems: theory and practice". In: *Autonomous Robots* (2023). Under review. arXiv: 2302.04770 [eess.SP].
- [2] Vrba, M., **Walter, V.**, Pritzl, V., Pliska, M., Baca, T., Spurny, V., Hert, D., Saska, M. "On Onboard LiDAR-based Flying Object Detection". In: *IEEE Transactions on Robotics* (2023). Under review. arXiv: 2303.05404 [cs.RO].
- [3] **Walter, V.**, Vrba, M., Licea, D. B., Saska, M. "Distributed formation-enforcing control for UAVs robust to observation noise in relative pose measurements". In: *IEEE Transactions on Robotics* (2023). Under review. arXiv: 2304.03057 [cs.RO].