André Gonçalves Mateus

Uppsala, Sweden
(046)734198165 ● andrgmateus@gmail.com ● mateus03.github.io

Short Bio

Since September of 2021, I have been a Researcher at Ericsson Research with the Internet of things and Cyber-Physical Systems team. I hold a M.Sc. (2015) and a Ph. D. (2022) in Electrical and Computer Engineering from Instituto Superior Técnico, Universidade de Lisboa. Since 2018, I have been a Member of the Institute of Electrical and Electronics Engineers (IEEE). My research interests include Computer Vision and Robotics, particularly Visual Servoing; Active Vision; Structure-from-Motion; and SLAM.

Experience

- **Senior Researcher** [2023-]
  - at Ericsson Research, Stockholm;
  - Main responsibilities:
    - Development of scaling and densification of sparse Structure-from-Motion 3D models, based on Neural Radiance Fields principles;
    - Enable visual localization between heterogeneous visual odometry and/or SLAM algorithms using different feature descriptors (e.g., SIFT and ORB);
    - Supervision of Master thesis students (two), and PhD students (two).
- **Experienced Researcher** [2021-]
  - at Ericsson Research, Stockholm;
  - Main responsibilities:
    - Development of a full Structure from Motion pipeline based on panoramic images;
    - Enable visual localization between heterogeneous visual odometry and/or SLAM algorithms.
    - Supervision of research interns (three), Master thesis students (three), and a PhD student

Activities

- **Research Assistant** [2015-2021]
  - at Institute of Systems and Robotics, Lisbon

Education

- **Ph.D. Student** [2017-2022]
  - of the Doctoral Programme in Electrical and Computer Engineering at Instituto Superior Técnico, University of Lisboa;
  - Ph.D. Thesis: “On the Exploitation of 3D Straight Lines for Active Mapping and Camera Localization”.

- **M.Sc. in Electrical and Computer Engineering** [2012-2015]
    - from Instituto Superior Técnico, University of Lisboa;
      Major in Systems, Decision, and Control;
      Minor in Computers;
      Master Thesis: “Human-Aware Navigation in Networked Robot Systems”
- **B. Sc. in Electrical and Computer Engineering** [2009-2012]
    - from Instituto Superior Técnico, University of Lisboa;

Research Projects

- **INSIDE:** Intelligent Networked Robot Systems for Symbiotic Interaction with Children with Impaired Development
    - Research Assistant [2015-2017]
    - In charge of system architecture and module integration in ROS
- **SocRob** – Soccer Robots and Society of Robots
    - Research Assistant [2014-2016]
    - Responsible for person detection and tracking
- **STORE-SLAM**
    - Ph. D. Grant [2021]
    - Co-supervision of research interns working in developing a Visual SLAM algorithm for mobile robots operating in retail stores.

Awards

- **Academic Merit (two times)** [2012,2013]

Research Grants

- **Ph. D. grant** [2017-2021]
    - Awarded by the Portuguese Foundation for Science and Technology (FCT). Reference: PD/BD/135015/2017

Publications

- **Journal Papers**
    - [1] **A Mateus**, S Ranade, S Ramalingam, P Miraldo. Fast and Accurate 3D Registration from Line Intersection Constraints International Journal of Computer Vision (IJCV), 2023.
    - [2] **A. Mateus**, O. Tahri, A. P. Aguiar, P. U. Lima, and P. Miraldo. On Incremental Structure-from-Motion using Lines. IEEE Transactions on Robotics (T-RO), 2021.
    - [3] F. S. Melo, A. Sardinha, D. Belo, M. Couto, M. Faria, A. Farias, H. Gambôa,C. Jesus, M. Kinarullathil, P. Lima, L. Luz, **A. Mateus**, I. Melo, P. Moreno, D. Osório, A. Paiva, J. Pimentel, J. Rodrigues, P. Sequeira, R. Solera-Ureña, M. Vasco, M. Veloso, and R. Ventura. Project INSIDE: towards autonomous semi-unstructured human-robot social interaction in autism therapy. Artificial Intelligence in Medicine (AIM), 96:198–216, 2019.

- [4] **A. Mateus**, D. Ribeiro, P. Miraldo, and J. C. Nascimento. Efficient and Robust Pedestrian Detection using Deep Learning for Human-Aware Navigation. Robotics and Autonomous Systems (RAS), 113:23–37, 2019.

- **Conference Papers**
  - [5] J. Choncholas, P. Kachana, **A. Mateus**, G. Phillips, A. Gavrilovska. Snail: Secure Single Iteration Localization. In Proceedings on Privacy Enhancing Technologies (PoPETs), 2024 (to appear).
  - [6] **A. Mateus,** P. U. Lima, and P. Miraldo. An observer cascade for velocity and multiple line estimation. In IEEE Int'l Conference on Robotics and Automation (ICRA), 2022.
  - [7] **A. Mateus,** S. Ramalingam, and P. Miraldo. Minimal solvers for 3d scan alignment with pairs of intersecting lines. In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), pages 7234–7244, 2020.
  - [8] **A. Mateus**, O. Tahri, and P. Miraldo. Active Estimation of 3D Lines in Spherical Coordinates. In American Control Conf. (ACC), pages 3950–3955, 2019.
  - [9] **A. Mateus**, O. Tahri, and P. Miraldo. Active Structure-from-Motion for 3D Straight Lines. In IEEE/RSJ Int'l Conf. Intelligent Robots and Systems (IROS), pages 5819–5825, 2018.
  - [10] D. Ribeiro, **A. Mateus**, P. Miraldo, and J. C. Nascimento. A Real-Time Deep Learning Pedestrian Detector for Robot Navigation. In IEEE Int'l Conf. Autonomous Robot Systems and Competitions (ICARSC), pages 165–171, 2017.
  - [11] **A. Mateus**, P. Miraldo, P .U. Lima, J. Sequeira, Human-aware navigation using external omnidirectional cameras. In Iberian Robotics Conference, 2015, pp. 283–295.

Press Coverage

- Our work in Human-Aware Navigation [3], and [7] (with D. Ribeiro, P. Miraldo, and J. C. Nascimento) has been mentioned in a Matlab Community Video [2018]. Link.

Teaching

- **Optimization and Algorithms** [2018-2019]
  - Teaching Assistant
- **Systems Programming** [2021]
  - Teaching Assistant

PhD Students

- Paula Carbó Cubero, KTH - Sweden, 2022-2027 (co-supervision with José Araújo (Ericsson) and Patric Jensfelt (KTH)).

Title: "Heterogeneous localization and mapping for collaborative 5G-enabled mobile devices”.

- José Miguel de Almeida Pedro, KTH – Sweden, , 2023-2028 (co-supervision with José Araújo (Ericsson) and Patric Jensfelt (KTH)).
  Title: “CVC-SLAM: Cooperative Video Coding for Localization & Mapping in 5G-enabled mobile devices”.

Former Students

- **M. Sc.**
  - Guangzhi Wang, KTH - Sweden, Spring 2023
    Title: "SLAM enhancements to compensate for image compression";
  - Herman Bleneros, KTH - Sweden, Spring 2023
    Title: “Adaptive Image Resolution for Visual SLAM on Resource-constrained Devices";
  - Viktor Jonsson, KTH - Sweden, Fall 2022
    Title: "Collaborative Exploration with Intermittent Communication";
  - Soraia Mendes Ferreira, IST -Portugal, Spring 2016
    Title: “Mobile Arm Visual Servoing for Object Manipulation”

Languages

- **Mother tongue:** Portuguese
- **Foreign language:** English (proficient), Swedish (Basic)