

Guilherme Augusto POTJE

PERSONAL DATA

PLACE AND YEAR OF BIRTH: Presidente Prudente, SP, Brazil | 1991
CITIZENSHIP: Brazilian
CURRENT LOCATION: Pampulha Area, Belo Horizonte – MG, Brazil
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EDUCATION

2018 – Current	<p>Ph.D. in COMPUTER SCIENCE <i>Federal University of Minas Gerais (UFMG), Belo Horizonte – MG, Brazil.</i> Fields: Computer Vision and Deep Learning Research Title: “Towards Deformation-Invariant Image Descriptors” Advisor: Prof. Erickson R. NASCIMENTO (UFMG) Co-Advisor: Prof. Renato MARTINS (UBFC) Link to project page</p>
2014 – 2016	<p>M.Sc. in COMPUTER SCIENCE <i>Federal University of Minas Gerais (UFMG), Belo Horizonte – MG, Brazil.</i> Field: Computer Vision Thesis: “On the Improvement of Three-Dimensional Reconstruction from Large Datasets” Advisor: Prof. Erickson R. NASCIMENTO (UFMG) Co-Advisor: Prof. Mario F. M. CAMPOS (UFMG) Link to thesis</p>
2010 – 2013	<p>Bachelor’s Degree in COMPUTER SCIENCE <i>Unoeste – FIPP, Presidente Prudente – SP, Brazil.</i> Field: Image Processing Thesis: “Building’s Roof Contour Extraction Using LiDAR and Aerial Images” Advisor: Prof. Mario A. PAZOTI (FIPP) Link to thesis</p>

WORK EXPERIENCE

2017 – 2018	<p>Research Engineer, VerLab and Instituto Tecnológico Vale (ITV) I worked as a Computer Vision research engineer on an R&D project founded by the Instituto Tecnológico Vale (ITV) called “EspeleoRobô”. The purpose of the research was to develop an autonomous robot for cavity exploration and tools for immersive visualization and interaction with 3D mapped cavities. In this project, my activities were focused on the 3D data processing by creating a full mesh reconstruction and texturing pipeline as a software using C++ and CGAL library. In this project, I also implemented an application to visualize the reconstructed 3D models through the Microsoft HoloLens device, using the Unity engine. Link to video</p>
2014 – 2016	<p>Graduate Research Intern, VerLab and Instituto Tecnológico Vale (ITV) As a Computer Vision researcher, I worked on a R&D project from Vale, the largest mining company from Brazil, that aimed to perform cooperative mapping using small autonomous aerial robots. The project involved several other researchers focused on robotics and mapping. My activities consisted of coupling 3D reconstruction from images, remote sensing, and geophysics. My contributions to the project were designing a complete structure-from-motion pipeline for 3D reconstruction from photos and a tool for magnetic data processing and data fusion that generates colored 3D magnetic maps. The project was implemented in C++ and Python using the following open-source libraries: OpenCV, Ceres Solver, OpenMVG, PCL, and SciPy. Link to video</p>

PUBLICATIONS

- 2022 **Potje, G.**, Martins, R., Cadar, F., Nascimento, E. R. “[Learning Geodesic-Aware Local Features from RGB-D Images](#)”. Computer Vision and Image Understanding (CVIU).
- 2021 **Potje, G.**, Martins, R., Cadar, F., Nascimento, E. R. “[Extracting Deformation-Aware Local Features by Learning to Deform](#)”. Thirty-fifth Conference on Neural Information Processing Systems (NeurIPS).
- 2021 Azpúrua, H., Rezende, A., **Potje, G.**, da Cruz Júnior, G. P., Fernandes, R., Miranda, V., ... & Freitas, G. M. “[Towards Semi-autonomous Robotic Inspection and Mapping in Confined Spaces with the EspeleoRobô](#)”. Journal of Intelligent & Robotic Systems.
- 2019 Nascimento, E. R., **Potje, G.**, Martins, R., Cadar, F., Campos, M. F., & Bajcsy, R. “[GEOBIT: A Geodesic-Based Binary Descriptor Invariant to Non-Rigid Deformations for RGB-D Images](#)”. International Conference on Computer Vision (ICCV).
- 2019 Azpúrua, H., **Potje, G. A.**, Rezeck, P. A., Freitas, G. M., Uzeda Garcia, L. G., Nascimento, E. R., ... & Campos, M. F. “[Cooperative Digital Magnetic-elevation Maps by Small Autonomous Aerial Robots](#)”. Journal of Field Robotics.
- 2017 **Potje, G.**, Resende, G., Campos, M. & Nascimento, E. R. “[Towards an Efficient 3D Model Estimation Methodology for Aerial and Ground Images](#)”. Machine Vision and Applications (MVA).
- 2016 Macharet, D. G., Perez-Imaz, H. I., Rezeck, P. A., **Potje, G. A.**, Benyosef, L. C., Wiermann, A., ... & Campos, M. F. “[Autonomous Aeromagnetic Surveys using a Fluxgate Magnetometer](#)”. Sensors.

AWARDS

- 2021 Google Latin America Research Awards (Google LARA). “Learning to Match Images of Deformable Objects”.

LANGUAGES

BRAZILIAN PORTUGUESE: Native
ENGLISH: Fluent

COMPUTATIONAL TOOLS KNOWLEDGE

Languages: C, C++, PYTHON, JAVA, C#, LATEX, SQL, JAVASCRIPT, HTML.
Software & Libraries: NumPy, SciPy, OpenCV, PyTorch, Tensorflow, Ceres Solver, Scikit-learn, Git, LINUX, OpenGL, CGAL, PCL, Unity 3D.

TOPICS OF INTEREST

General: Computer Vision, Deep Learning, Photogrammetry, Robotics, Computer Graphics, Artificial Intelligence
Specific: Image Matching, Structure-from-motion, 3D Reconstruction, 3D Vision