Alexandre Morgand

Computer Vision Research Scientist (PhD)
3D Vision · Neural Rendering · SLAM/VIO
Machine Learning for Vision · Paris · Hybrid

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Experience (10+ years in Computer Vision & ML)

2023–Present **Computer Vision Research Scientist**, ***Simulon***, **South Africa (remote)**

3D capture, reconstruction and neural rendering for the Simulon app

- **Photometric SLAM**: camera tracking and photometric calibration from handheld video
- **Dense reconstruction**: low-resolution LiDAR and monocular reconstruction from arbitrary video
- **3D Gaussian Splatting**: automated reconstruction of splat assets from 2K input images
- **Generative AI**: LoRA-based generation of photorealistic splat assets, cloud inference to iOS/Android
- **Neural rendering**: deferred reflection / relighting baked into 3DGS, rendered on device and web

2018–2023 **Computer Vision Scientist**, ***Slamcore***, **London**

Research in **SLAM** (**long-term mapping, multi-session**) — patent **US 11,830,218 B2**

- **R&D** on Slamcore's **Visual-Inertial Odometry system** (loop closure, sensor fusion, pose graph, state estimation)
- **Map management**: 80% smaller maps at equal localisation accuracy (reuse, compression)
- **QA**: Testing tools, accuracy metrics conception, dataset recording using Vicon system
- **Panoptic segmentation** for intelligent mapping

2014–2018 **PhD Student in Computer Vision**, ***CEA***, **Paris**

Thesis on Augmented Reality improvement (**Light source modeling, Inpainting, Diminished Reality in real-time**)

- Directed by **Adrien Bartoli** and supervised by **Mohamed Tamaazousti**

2013–2014 **Research Engineer**, ***CEA***, **Paris**

Augmented Reality for Military purposes and 3D localization for self-driving vehicles

- **Fiducial markers detection** for localisation and **constrained SLAM**
- **Real-time positioning system** for self-driving vehicles (cars, vacuum cleaners)

2012–2013 **Intern**, ***CEA***, **Paris**

Realism improvement for Augmented Reality (**Light sources modeling, Diminished Reality**)

- Real time Specularity Detection method published in VISAPP 2014

2011–2013 **Bioinformatics Teacher**, ***Sup'biotech***, **Paris**

30 students per class, freshman and sophomore

- **Python, CSS/HTML, MySQL**

2011–2012 **Intern**, ***Gostai (now Aldebaran)***, **Paris**

Urbi project in the Kernel team Urbiscript language improvement

- Debian/RPM packages for Urbi
- Robot prototyping linking **Blender** and Urbi

Education

2014–2018 **Phd Student in Computer Vision**, ***Clermont Auvergne University***

2008–2013 **Master Degree in Computer-Science**, ***EPITA***, Class rank: 2 of 41

2010 **University of California Berkeley**

Structure and Interpretation of Computer Programs CS61A and Machine Structures CS61C.

Skills

Computer Vision **Visual-Inertial Odometry/SLAM (monocular, stereo, depth), Sensor Fusion, State Estimation, 3D reconstruction, Neural Rendering (3D Gaussian Splatting, NeRF), Light Source Modeling, Inpainting, Augmented/Diminished Reality**

Machine Learning **Deep Learning (PyTorch), Generative Models (Diffusion, LoRA), Object Detection, Semantic & Panoptic Segmentation**

Generative AI **LoRA fine-tuning, SDXL, FLUX.1/2, ComfyUI, Image & Video generation**

Languages **C++, Python**, PyTorch, Matlab, GLSL

Tools ROS, Docker, Blender, COLMAP, OpenGL, Agisoft Photoscan, MeshLab, Photoshop

Achievements

Publications	**13 scientific international papers and journals, 3 patents**
Management	**5+ interns, Product release (Research/Coding/QA)**
Coordination	**3-5 research engineers**
Reviewer	**CVPR, ICCV, ECCV, ACCV, ISMAR, TVCG, ...**

Selected Publications

2017 **A. Morgand, M. Tamaazousti, A. Bartoli**, ***A Multiple-View Geometric Model of Specularities on Non-Uniformly Curved Surfaces***, *VRST*

2017 **A. Morgand, M. Tamaazousti, A. Bartoli**, ***A Geometric Model for Specularity Prediction on Planar Surfaces with Multiple Light Sources***, *IEEE TVCG*

2017 **A. Morgand, M. Tamaazousti, A. Bartoli**, ***A Multiple-View Geometric Model of Specularities on Non-Planar Shapes with Application to Dynamic Retexturing***, *IEEE TVCG*

2017 **J. Lin, M. Tamaazousti, S.H. Said, A. Morgand**, ***Color Consistency of Specular Highlights in Consumer Cameras***, *VRST*

2016 **A. Morgand, M. Tamaazousti, A. Bartoli**, ***An Empirical Model for Specularity Prediction with Application to Dynamic Retexturing***, *ISMAR*

2016 **A. Morgand, M. Tamaazousti, A. Bartoli**, ***Modèle empirique de prédiction géométrique de spécularité : application au retexturing***, *RFIA*

2015 **A. Morgand, M. Tamaazousti, A. Bartoli**, ***Reconstruction d'une source lumineuse modélisée par une quadrique à partir d'images multiples***, *ORASIS*

2015 **A. Morgand, M. Tamaazousti, A. Bartoli**, ***Détection générique et temps réel des spécularités***, *ORASIS*

2014 **A. Morgand, M. Tamaazousti**, ***Generic and Real-time Detection of Specular Reflections in Images***, *VISAPP*

Full list: Google Scholar.

Patents

2023 **P. Alcantarilla, A. Morgand, M. Boucher**, ***Visual-Inertial Localisation in an Existing Map***, *US 11,830,218 B2 — Slamcore Ltd*

2022 **P. Alcantarilla, A. Morgand, M. Boucher**, ***Visual-Inertial Localisation in an Existing Map***, *GB 2 599 947 B — Slamcore Ltd*

2019 **M. Tamaazousti, A. Morgand, A. Bartoli**, ***Method for Processing Images Having Specularities and Corresponding Computer Program Product***, *US 10,497,136 B2 / WO 2016/198389 A1 — CEA*