Rasoul Sharifian

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Short Scientific Bio

I am a Ph.D. candidate at Université Clermont Auvergne under the supervision of Prof. Adrien Bartoli. My research focuses on developing computer vision methods to enhance intraoperative visualization and surgical navigation in Minimally Invasive Surgery (MIS). Specifically, my current research focuses on real-time perspective correction in non-planar surgical scenes, robust depth estimation for MIS, and deformable organ registration.

Education

Ph.D. in Computer Science (Ongoing)
Université Clermont Auvergne, France, 2022 – Present
Thesis: Augmented Reality for Deformable Organ Registration in Minimally Invasive Surgery

Master of Science (M.Sc.) in Computer Science
Isfahan University of Technology, Iran, 2014 – 2017
Thesis: Demarcating Z-line and gastric folds boundary in endoscopy images
Achievements: Ranked 1st among 26 M.Sc. students, **GPA:** 20/20

Bachelor of Science (B.Sc.) in Electrical and Computer Engineering
Isfahan University of Technology, Iran, 2010 – 2014, **GPA:** 16/20

Publications

SurgIPC: A Convex Image Perspective Correction Method to Boost Surgical Keypoint Matching
R. Sharifian and A. Bartoli. *IPCAI, 2025*

The RoDEM Benchmark: Evaluating the Robustness of Monocular Single-shot Depth Estimation Methods in Minimally-Invasive Surgery
R. Sharifian, N. Rabbani and A. Bartoli. *IPCAI, 2025*

Automatic Smoke Analysis in Minimally Invasive Surgery by Image-based Machine Learning
R. Sharifian, H.M. Abrão, S. Madad-Zadeh, C. Seve, P. Chauvet, N. Bourdel, M. Canis and A. Bartoli. *Journal of Surgical Research, 2024*

Guiding Breast Conservative Surgery by Augmented Reality from Preoperative MRI: Initial System Design and Retrospective Trials
R. Sharifian, S. Madad-Zadeh, N. Bourdel, A. Giro, W. Marraoui, C. Pomel and A. Bartoli. *DEEPBREATH - Deep Breast Workshop on Breast Care at MICCAI, 2024*

Kidney Tracking for Live Augmented Reality in Stereoscopic Mini-Invasive Partial Nephrectomy
K. Chandelon, **R. Sharifian**, M. Salomé, A. Khaddad, N. Bourdel, N. Mottet, B. Jean-Christophe and A. Bartoli. *Computer Methods in Biomechanics and Biomedical Engineering: Imaging and Visualization, 2023*

Demarcating Z-line and Gastric Folds Boundary Based on the Segmentation of the Lower Esophageal Sphincter Images
R. Sharifian, B. Nazari, S. Sadri and P. Adibi. *Journal of Medical Signals and Sensors, 2023*

Related Work Experience

Research Engineer 08/2021 – 10/2022
EnCoV, Institut Pascal, Clermont-Ferrand, France, `https://encov.ip.uca.fr/index.php`

- **Smoke Management in MIS, Project Lead:** Developed a machine learning system for automatic surgical smoke evacuation in MIS. Successfully evaluated in clinical settings and published in the *journal of surgical research.*

Research and Development Engineer 05/2017 – 04/2021
Behyaar, Isfahan, Iran, `https://behyaar.com`, `https://partosazan.com`

- **Contouring for Treatment Planning System (TPS), Project Lead:** Led development of an automatic contouring system for CT scan images to be integrated in TPS software. Implemented DICOM RT struct reading and writing using the DCMTK library.
  - Successfully deployed in multiple clinical environments, enhancing radiotherapy workflow.
- **Dual-Energy X-ray Imaging for Security Systems:** Developed dual-energy X-ray imaging techniques for material atomic number estimation in cargo and airport security inspections.
  - Successfully integrated and deployed in industrial security systems.

Awards and Honors

IPCAI Student Award, 16th IPCAI, Berlin 2025
2nd Best Poster Prize, 27th BMVA Computer Vision Summer School, UK 2024
CIFRE Ph.D. Fellowship, French Industrial Research Collaboration 2022 – Present
Ranked 1st among 26 M.Sc. students, Isfahan University of Technology 2016
National University Entrance Exam: Ranked 371, Top 0.2% Among 300,000+ participants 2010

Technical Skills

Programming: Python, C++, MATLAB
Deep Learning & Machine Learning: PyTorch, TensorFlow, Scikit-learn
Computer Vision & Medical Image Processing: OpenCV, Open3D, DCMTK, ITK
Graphics & Visualization: Blender, VTK

References

Prof. Adrien Bartoli
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Prof. Behzad Nazari
Associate Professor, Isfahan University of Technology
Email: nazari@cc.iut.ac.ir

Prof. Saeid Sadri
Professor, Isfahan University of Technology
Email: sadri@cc.iut.ac.ir

Prof. Peyman Adibi
Professor, Isfahan University
Email: adibi@med.mui.ac.ir