Mazen Mel

Ph.D Student

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I have worked on research and development projects involving high- and low-level image processing and understanding. I am interested in signal processing and optimization topics, particularly those related to imaging. I have accumulated relevant experience in computational imaging/photography, spectral imaging, holographic imaging, depth sensing, camera optics, and imaging pipelines. Throughout my PhD, I supervised multiple M.Sc. students both in academia and in industry.

Work & Academic Experience

Mar. 2023 - Present
Visiting Researcher, Sony Europe B.V. - Stuttgart, Germany.
Supervisors: Alexander Gatto, Paul Springer.
- Currently developing computational approaches for holographic and lensless microscopic imaging.
- Supervised (2) internship students.
- Filed (3) patents.

Feb. 2022 - Feb. 2023
Teaching Assistant, University of Padova - Padua, Italy.
- M.Sc. courses: Computer Vision (21/22), Machine Learning (22/23).
- Supervised (2) M.Sc. thesis students.

Nov. 2020 - Apr. 2021
Master Thesis Student, Sony Europe B.V. - Stuttgart, Germany.
- Developed end-to-end joint optimization framework for camera optics and monocular depth estimation approach.
- Published (1) Journal paper.
- Filed (1) patent.

Feb. 2019 - Sep. 2019
Research Intern / Eng. Graduation Thesis, University of Padova, Department of Information Engineering, LTTM research group. - Padua, Italy
Supervisors: Pietro Zanuttigh, Umberto Michiele.
- Developed knowledge transfer techniques and multitask learning strategies for coarse to fine semantic segmentation of indoor scenes.
- Published (1) journal paper.

Education

Oct. 2021 - Exp: Oct. 2024
Ph.D. in Information Engineering, University of Padova, Department of Information Engineering, LTTM research group.
Supervisor: Pietro Zanuttigh.
Research topics: Spectral imaging, holographic and lensless imaging, passive depth sensing.
Fellowships: University Scholarship & Sony R&D Scholarship.

Oct. 2019 - Sep. 2021 **M.Sc. in ICT for Internet and Multimedia**, University of Padova.
Grade: 110/110 cum Laude.
Thesis: Deep Learning Based Depth and Image Reconstruction Using Rotating Point Spread Functions.
Supervisor: Pietro Zanuttigh.

Sep. 2016 - Sep. 2019 **Engineering Degree in Telecommunications (EQF level 7)**, Higher School of Communications of Tunis.
Grade: No official final mark issued.
Thesis: Multi-Task Incremental Learning Techniques for RGB-D Semantic Segmentation.
Supervisor: Pietro Zanuttigh.

Sep. 2014 - Jun. 2016 **First Cycle Degree in Physics and Technology**, Institut Préparatoire aux Études d'Ingénieur d'El Manar.
National rank (over ∼1000): 9.
Courses: Extensive preparatory Mathematics, Physics, and other technical courses for engineers.
Ranked among top 10 candidates in the national entrance exams for engineering schools.

Scholarships & Awards

- International
  - **Departement of Information Engineering - Padua Italy** PhD Scholarship.
  - **Sony R&D - Stuttgart Germany** PhD Scholarship (EUR 80k).
  - **Sony R&D - Stuttgart Germany** PhD Mobility Scholarship (EUR 20k).
  - **ERASMUS+ - Padua Italy** Master Thesis Support (EUR 4k)
  - **ERASMUS+ Traineeship - Padua Italy** Studies Abroad (EUR 8k).
- Domestic
  - **First Cycle Degree - Tunis Tunisia** Recognition Award (top 10 ranked students).
  - **High School - Gafsa Tunisia** Admission to the pioneering high school of Gafsa.

Computer Skills

- **Programming, versioning, and scripting**: Python, Matlab/GNU Octave, C++, Git, SVN, (previous experience in C, Bash).
- **Typesetting**: LaTeX, Markdown.
- **Deep learning/Image processing**: PyTorch, TensorFlow, Keras, OpenCV.
- **OS**: Windows, Linux.
- **HPC**: Slurm, Singularity, Docker.

Languages

Arabic	Native proficiency
French	Full professional proficiency
English	Full professional proficiency
Italian	Intermediate proficiency
German	Intermediate proficiency

Attended Conferences and Seasonal Schools

- ICVSS 2023 - International Computer Vision Summer School, Sicily Italy.
- OCM 2023 - Optical characterization of Materials - Karlsruhe Germany.
- GTTI MMSP 2023 - Thematic Meeting on Multimedia Signal Processing, Bressanone Italy.
- BMVC 2022 - British Machine Vision Conference, London United Kingdom.
- IEEE/DEI SSIE 2022 - Ph.D. School of Information Engineering "Silvano Pupolin", Bressanone Italy.
- GTTI MMSP 2022 - Thematic Meeting on Multimedia Signal Processing, Bardonecchia Italy.

Reviewer

ECCV, **Optica** Optics Express, JOSA A, Applied Optics, **IEEE** TMM, **Springer** TVCJ, **SPIE** Optical Engineering, Journal of Electronic Imaging.

References

Pietro Zanuttigh Associate Professor, University of Padova, Padua, Italy.
E-mail: zanuttigh@dei.unipd.it

Alexander Gatto Senior Manager, Sony Europe B.V., Stuttgart, Germany.
E-mail: alexander.gatto@sony.com

Paul Springer Principal Engineer, Sony Europe B.V., Stuttgart, Germany.
E-mail: paul.springer@sony.com

Muhammad Siddiqui Senior Engineer, Sony Europe B.V., Stuttgart, Germany.
E-mail: muhammad.siddiqui@sony.com

Interests

Fitness (weight lifting), Music.

Publications

Journals

[J1] M. Mel, A. Gatto, P. Zanuttigh, Joint reconstruction and spatial super-resolution of hyper-spectral ctis images via multi-scale refinement (2024).

[J2] M. Mel, M. Siddiqui, P. Zanuttigh, End-to-end learning for joint depth and image reconstruction from diffracted rotation, The Visual Computer (2023) 1–17.

[J3] M. Zimmermann, S. Amann, M. Mel, T. Haist, A. Gatto, Deep learning-based hyperspectral image reconstruction from emulated and real computed tomography imaging spectrometer data, Optical Engineering 61 (5) (2022) 053103–053103.

[J4] M. Mel, U. Michieli, P. Zanuttigh, Incremental and multi-task learning strategies for coarse-to-fine semantic segmentation, Technologies 8 (1) (2019) 1.

Conferences

[C1] Amann, Simon* and Mel, Mazen*, P. Zanuttigh, T. Haist, M. Kamm, A. Gatto, et al., Material characterization using a compact computed tomography imaging spectrometer with super-resolution capability, in: Proceedings of the 6th International Conference on Optical Characterization of Materials, OCM 2023, 2023, pp. 139–148.

[C2] M. Mel, A. Gatto, P. Zanuttigh, Joint reconstruction and super resolution of hyper-spectral ctis images, in: 33rd British Machine Vision Conference, 2022, pp. 21–24.

[C3] M. Mel, P. Springer, P. Zanuttigh, H. Zhou, A. Gatto, Holoadmm: High quality holographic complex field recovery, 2024.

Patents

[P1] M. Mel, A. Gatto, Enhanced spectral image reconstruction from ctis image (Filed in 2023).

[P2] S. Amann, M. Mel, A. Gatto, Apparatuses and methods for computer tomography imaging spectrometry (Filed in 2023).

[P3] M. Siddiqui, M. Mel, Method and system for image and depth using learned rotating point spread functions (rpsf) (Filed in 2021).

[P4] M. Mel, P. Springer, P. Zanuttigh, A quantitative imaging device, computer program and method thereof (Filed in 2024).

* indicates equal contribution

Latest update: 10.12.2023