Mazen Mel, Ph.D

Applied Scientist
Imaging & Computer Vision

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I am an Applied Scientist and Senior Engineer with a Ph.D. in Information Engineering. I am interested in signal processing and optimization topics, particularly those related to imaging and computer vision. I have accumulated relevant experience in computational imaging/photography; spectral imaging; holographic imaging; depth sensing; camera optics; imaging pipelines; and model optimization for real-time deployment. I am leading a cross-functional R&D team at Sony Europe.

Experience

Nov. 2024- Present — **Senior Engineer**, Sony Europe Ltd. - Stuttgart, Germany.
- Leading a small team developing next-gen snapshot spectral sensing cameras.
- Built AI models for image reconstruction and enhancement, achieving SOTA performance in spectral and holographic imaging.
- Accelerated model-based image reconstruction solvers by $> 95\%$ (days to <1 hour) through CUDA-enabled optimization and scalable processing pipelines.
- Delivered end-to-end prototypes integrating optics and ML software, now used internally for mobile sensing research.
- Advocated for structured and reproducible workflows via the use of CI/CD pipelines.
- Designed and implemented blind optimizations for color correction of new automotive HDR sensors.

Mar. 2023 - Aug 2024 — **Visiting Researcher**, Sony Europe Ltd. - Stuttgart, Germany.
- Designed computational methods for holographic and lensless microscopic imaging and data-driven snapshot compressive spectral imaging.
- Published at ECCV, BMVC, and filed 3 patents covering novel imaging systems and vision-based AI.
- Collaborated with multi-cultural teams in Germany, Italy, and Japan.

Feb. 2022 - Feb. 2023 — **Teaching Assistant**, University of Padova - Padua, Italy.
- Assisted in teaching M.Sc. courses: Computer Vision (2021/2022) and Machine Learning (2022/2023).
- Supervised 2 M.Sc. thesis students in deep learning and image reconstruction and denoising.

Education

Oct. 2021 - Oct. 2024 — **Ph.D. in Information Engineering**, University of Padova.
Focus: Spectral imaging, holographic imaging, passive depth sensing.

Oct. 2019 - Sep. 2021 — **M.Sc. ICT for Internet and Multimedia**, University of Padova.
Graduated 110/110 cum Laude.
Thesis on deep learning for scene depth estimation with engineered camera optics.

Sep. 2016 - Sep. 2019 — **Engineering Degree in Telecommunications**, SUP'COM.
Thesis on semantic image segmentation and knowledge transfer.

Sep. 2014 - Jun. 2016 — **First Cycle Degree in Physics and Technology**, Institut Préparatoire aux Études d'Ingénieur d'El Manar.
Ranked among the top 10 candidates nationwide in the engineering school entrance examinations.

Key Achievements

- **Patents (4):** Innovations in imaging devices, hyperspectral imaging, and quantitative phase imaging.
- **Publications:** 4 peer-reviewed journals (IEEE TCI, Optical Engineering), 5 conferences (ECCV, BMVC, OCM, MICAD).
- **Awards & Grants:** DAAD Research Grant (EUR 7k), Sony Ph.D. Project Funding (EUR 110k), Sony Mobility Scholarship (EUR 20k), Ph.D. fellowship at DEI (3 years), Erasmus fellowship at the University of Padova.

Technical Skills

- **Imaging & Vision:** Computational photography, spectral/holographic imaging, depth sensing, camera optics & imaging pipeline.
- **Optical design:** Zemax OpticStudio
- **Programming:** Python, C++, Matlab, Git, CI/CD pipelines.
- **Deep learning/Image processing:** PyTorch, TensorFlow, Keras, OpenCV.
- **Deployment:** LiteRT, QAT, NN Compression.
- **Systems & HPC:** Docker, Slurm, Linux, Windows.
- **Soft Skills:** Leadership, student mentoring, cross-cultural collaboration.

Languages

Arabic (Native), English (Full professional), French (Full professional), Italian (Intermediate), German (Intermediate)

Attended Conferences and Seasonal Schools

- DGaO 2025 - Die Deutsche Gesellschaft für angewandte Optik, Stuttgart Germany.
- 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

NeurIPS 2025, **BMVC 2024**, **Optica** Optics Express, JOSA A, Applied Optics, **IEEE** TMM, TCI, **SPIE** Optical Engineering, Journal of Electronic Imaging.

Interests

Fitness (weight lifting), Music (Techno).

Publications

Journals

[J1] M. Mel, A. Gatto, P. Zanuttigh, Joint reconstruction and spatial super-resolution of hyper-spectral ctis images via multi-scale refinement, IEEE Transactions on Computational Imaging (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] M. Mel, S. Lin, A. Gatto, An ultra-compact hyper-spectral imager based on mactis technology, in: Die Deutsche Gesellschaft für angewandte Optik (DGaO), 2025.

[C2] H. Zhou, M. Mel, P. Springer, A. Gatto, Cross-net: Joint in-line holographic image reconstruction and refocusing, in: Medical Imaging and Computer-Aided Diagnosis (MICAD), 2024.

[C3] M. Mel, P. Springer, P. Zanuttigh, A. Gatto, Holoadmm: high-quality holographic complex field recovery, in: The European Conference on Computer Vision (ECCV), 2024.

[C4] 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, pp. 139–148.

[C5] M. Mel, A. Gatto, P. Zanuttigh, Joint reconstruction and super resolution of hyperspectral ctis images, in: 33rd British Machine Vision Conference (BMVC), 2022, pp. 21–24.

Patents

[P1] M. Mel, P. Springer, P. Zanuttigh, A quantitative imaging device, computer program and method thereof (WO Patent WO2025186104A8).

[P2] M. Mel, A. Gatto, Apparatus, snapshot hyperspectral imaging device and method (WO Patent WO2025040570A1).

[P3] S. Amann, M. Mel, A. Gatto, Apparatuses and methods for computer tomography imaging spectrometry (WO Patent WO2024083580A1).

[P4] M. Siddiqui, M. Mel, Camera, method and image processing method (WO Patent WO2023001674A2).

* indicates equal contribution.

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