



David Iommi

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ABOUT ME

Skilled in medical image analysis, hybrid imaging and deep learning. Graduated Ph.D. in Medical Physics (Medical University of Vienna). Master's Degree focused in Biomedical Engineering from Politecnico di Torino (Italy).

JOB-RELATED SKILLS

Main skills gained as PhD candidate at QIMP

- Computer vision and image-processing
- Artificial intelligence for medical imaging segmentation and registration
- Medical imaging analysis
- Experience in quantitative and molecular imaging
- Experience in ultrasound imaging and tracking systems for image surgery
- Master students tutoring

WORK EXPERIENCE

Post doc Researcher

Medical University of Vienna [09/2021 – Current]

City: Vienna

Country: Austria

Developing deep learning tools to perform fully-automatic segmentation and classification of prostate cancer metastasis in PSMA-PET imaging. The algorithms have been used by clinicians for research purposes in Machine learning-based risk classification.

PhD candidate

Medical University of Vienna [03/04/2018 – 07/09/2021]

City: Vienna

Ph.D. project: "Ultrasound-guided intervention based on hybrid image information".

European Union's Horizon 2020 research and innovation program under the Marie Skłodowska-Curie grant agreement No 764458.

The project forecasts the development of a prototype for image fusion between PET/MR and trans-rectal ultrasound (US) images for prostate biopsy. An optical tracking system and an additional abdominal 3D-US imaging were employed to link the pre-operative PET/MR with the interventional US imaging. The navigation system showed sufficient accuracy for fusion-guided biopsy procedures with prostate phantoms. Secondary projects included the usage of deep learning to perform segmentation and registration and image processing tasks on molecular imaging patients' data. The algorithms have been developed and then used by clinicians for research purposes.

PUBLICATIONS

Conditional Generative Adversarial Networks (cGANs) aided motion correction of dynamic 18 F-FDG PET brain studies

<https://jnm.snmjournals.org/content/early/2020/11/27/jnumed.120.248856.long>

Shiyam Sundar LK*, Iommi D*, Muzik O, Chalampalakis Z, Klebermass EM, Hienert M, Rischka L, Lanzenberger R, Hahn A, Patariaia E, Traub-Weidinger T, Beyer J Nucl Med. 2020 Nov 27; jnumed.120.248856. doi: 10.2967/jnumed.120.248856.

3D ultrasound guided navigation system with hybrid image fusion

<https://www.nature.com/articles/s41598-021-86848-1>

[David Iommi](#), [Alejandra Valladares](#), [Michael Figl](#), [Marko Grahovac](#), [Gabor Fichtinger](#) & [Johann Hummel](#)

[Scientific Reports](#) volume 11, Article number: 8838 (2021) <https://doi.org/10.1038/s41598-021-86848-1>

Evaluation of 3D ultrasound for image guidance

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0229441>

Iommi D, Hummel J, Figl ML. Evaluation of 3D ultrasound for image guidance. PLoS One. 2020 Mar 26;15(3):e0229441. doi: 10.1371/journal.pone.0229441.

CONFERENCES

Data-driven motion compensation of [18F]FDG-PET brain imaging using conditional Generative Adversarial Networks (cGANs)

Iommi D, Shiyam Sundar LK, Muzik O, Chalampalakis Z, Klebermass EM, Hienert M, Rischka L, Lanzenberger R, Hahn A, Patariaia E, Traub-Weidinger T, Beyer EUROPEAN JOURNAL OF NUCLEAR MEDICINE AND MOLECULAR IMAGING, 47, SPRINGER, 2020, Cutting Edge Science Track - TROP Session: AI - Image Processing and Data Corrections.

https://www.youtube.com/watch?v=kZluC3Anaks&ab_channel=QIMPVienna

Error analysis for a navigation system using 3D abdominal ultrasound

Iommi D, Vallarades A, Figl M and Hummel J Proc. SPIE 113115, Medical imaging 2020: Image-Guided Procedures, Robotic Interventions and Modeling, SPIE 2020 Conference Proceedings, 1131151Z (16 March 2020) doi: 10.1117/12.2548866

Carotid restenosis risk via hemodynamic and morphometric analysis: a 5 year follow-up

Gallo, D; Domanin, M; Iommi, D; Vergara, C; Morbiducci, U In: Sixth national congress of bioengineering proceedings Patron Editore (ITALIA) Sixth national congress of bioengineering (Milan (Italy)) June 25-28, 2018

Data-driven motion compensation using cGAN for total-body [18F]FDG-PET imaging

Lalith Shiyam Sundar, David Iommi, Benjamin Spencer, Qian Wang, Simon Cherry, Thomas Beyer and Ramsey Badawi

Journal of Nuclear Medicine May 2021, 62 (supplement 1) 35;

DIGITAL SKILLS

My Digital Skills

Proficient user

Deep Learning / VMTK / 3D Printing / Image Preprocessing and Image Classification. / Algorithms in computer vision AI deep learning image segmentation / MS Office (World Excel Power Point Access) / Machine Learning and Deep Learning frameworks: Tensorflow, Keras, PyTorch / Programmin language PYTHON / Programmin language MATLAB / MONAI / Image Processing (Image Classification, Object Detection) / ITK/VTK / Proficient User of Latex

Novice User

Ansys FLUENT / 3D Modelling Software(3-Matic Materialise) / MS Nastran, Patran (Structure Analysis) / Statistical Parametric Mapping (SPM) / SPM 12 (MatLab) / C C++ C

LANGUAGE SKILLS

Mother tongue(s): **Italian**

Other language(s):

English

LISTENING C2 READING C2 WRITING C2

SPOKEN PRODUCTION C2 SPOKEN INTERACTION C2

German

LISTENING A2 READING A2 WRITING A1

SPOKEN PRODUCTION A2 SPOKEN INTERACTION A2

NETWORKS AND MEMBERSHIPS

HYBRID2020 Consortium

[2018 – 2021]

European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No. 764458.

<https://www.hybrid2020.eu/home.html>

European Association of Nuclear Medicine

[2020 – Current]

QIMP: Quantitative Imaging and Medical Physics.

[Vienna, 2018 – Current]

<https://zmpbmt.meduniwien.ac.at/en/general-information/team-and-contact/research-groups/qimp-team/>

EDUCATION AND TRAINING

Master of Science

Politecnico di Torino (Polytechnic of Turin) [2014 – 2017]

Address: Corso Duca degli Abruzzi, 24, 10129 Turin (Italy)

<https://www.polito.it/>

Field(s) of study: Biomedical Engineering

Final grade : Final grade: 106/110

Thesis: Prediction of restenosis risk in the carotid bifurcation via hemodynamic and geometric analysis

Courses:

- Active implantable devices/Medical images
- Applied mechanics to biomedical systems
- Biomedical Transport Phenomena/Biomechanics

- Biomedical instrumentation
- Biomedical signal processing
- Bionanotechnologies
- Classification and interpretation of biomedical data
- Design of prostheses and artificial organs
- Experimental biomechanics and biodynamics / Cardiovascular biomechanics
- Materials for Bioengineering

Bachelor of Technology

Politecnico delle Marche (Marche Polytechnic University) [2010 – 2014]

Address: Via Lodovico Menicucci, 6, 60121 Ancona (Italy)

<https://www.univpm.it/Entra/>

Field(s) of study: Biomedical Engineering

Final grade : Final grade: 101/110

Thesis: Comparison of techniques for the measurement of respiratory rate.

CREATIVE WORKS

"Marie Curie discovers modern nuclear medicine"

[11/2020]

Contribution to the video "Marie Curie discovers modern nuclear medicine" for the digital "Die Lange Nacht der Forschung" 2020, Vienna

<https://www.langenachtderforschung.at/2020/index.html>

HOBBIES AND INTERESTS

Hobbies

I enjoy traveling and visiting museums in the locations of the trip. I spend hours watching ancient Roman history documentaries. I keep sports (calisthenics and swimming) and one day I would like to learn basketball.