# Fatih Aksu

*Curriculum Vitae*

## Professional Experience

Nov. 2024 - Today **Research Fellow**, *Università Campus Bio-Medico di Roma*, Italy

Nov. 2021 – Oct. 2024 **Doctoral Researcher**, *Humanitas University*, Italy

Sept. 2019 – Sept. 2021 **Research Assistant**, *Middle East Technical University Northern Cyprus Campus*, Turkey

## Education

2021 – Today **PhD in Artificial Intelligence (Health and Life Sciences)**, *Università Campus Bio-Medico di Roma*, Italy

- **Thesis title:** A Multimodal Approach for Histological Subtype Classification in NSCLC Using PET and CT Images (tentative)
- **Supervisors:** Prof. Letterio Salvatore Politi, Prof. Arturo Chiti, Prof. Paolo Soda

2019 – 2021 **MSc in Electrical and Electronics Engineering**, *Middle East Technical University Northern Cyprus Campus*, Turkey

- Taught in English
- **Final mark:** 3,86/4,00
- **Thesis title:** Person Re-identification Using Convolutional Neural Networks
- **Supervisor:** Assoc. Prof. Cem Direkoğlu

2011 – 2019 **BSc in Electrical and Electronics Engineering**, *Middle East Technical University Northern Cyprus Campus*, Turkey

- Taught in English
- **Final mark:** 2,65/4,00
- **Thesis title:** Autonomous UAV Navigation Using a Monocular Camera
- **Supervisor:** Assoc. Prof. Cem Direkoğlu

## Post-master Courses

July 6-9, 2024 **OxML 2024: Oxford Machine Learning Summer School**, AI for Global Goals

Feb. 13-27, 2024 **Federated Learning: How it will protect our privacy in everyday life**, *Università Campus Bio-Medico di Roma*

Sept. 25-29, 2023 **PhD School on AI in Health and Life Sciences**, *Università Campus Bio-Medico di Roma*

July 13-16, 2023 **OxML 2023: Oxford Machine Learning Summer School**, AI for Global Goals

March 13-17, 2023 **Introduction to Neuromorphic Computing**, *Universita degli Studi di Roma Tor Vergata*

Oct. 17-Nov. 10, 2022 **Can we trust AI? Opening the black box**, *Università Campus Bio-Medico di Roma*

Sept. 26-30, 2022 **PhD School on AI in Health and Life Sciences**, *Università Campus Bio-Medico di Roma*

March, 2022 **AI for Medicine Specialization**, *Coursera*

March, 2021 **Deep Learning Specialization**, *Coursera*

*Rome – Italy*
*fatih.aksu@unicampus.it* • *aksufatih.github.io* • *Fatih Aksu*
*aksufatih* • *aksu-fatih*

## Grants and Scholarships

2024 **Research Grant**, *Università Campus Bio-Medico di Roma*, Duration: 2 years
Research title: "Artificial Intelligence Methods for the Development of Predictive Tools in Lung Cancer"

2021 **Grant for the XXXVII Italian National PhD Program in Artificial Intelligence**, *Università Campus Bio-Medico di Roma*, Duration: 3 years

2019 **Grant for the Master's degree in Electrical and Electronics Engineering**, *Middle East Technical University Northern Cyprus Campus*, Duration: 2 years

2011 **100% Tuition fee waiver for Bachelor's degree in Electrical and Electronics Engineering**, *Middle East Technical University Northern Cyprus Campus*, Duration: 5 years

## Awards

July 2023 **Winner of the MLxCases Health Competition**, Oxford Machine Learning Summer School 2023, AI for Global Goals

## Teaching

### Teaching Assistanship

2024 – Today **Fundamentals of Computer Science**, *10 ECTS*, Bachelor's Degree in Biomedical Engineering, Faculty of Engineering, Università Campus Bio-Medico di Roma

2023 – Today **Fundamentals of Computer Science**, *5 ECTS*, Master's Degree in MedTech, Faculty of Medicine and Surgery, Università Campus Bio-Medico di Roma

## Academic Service

### Program Committee Member

2023 – 2025 **IEEE International Symposium on Computer-Based Medical Systems (CBMS)**

### Reviewer

2025 **International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)**

2025 **International Conference on Machine Vision Applications (MVA)**

## Research Interests

My research focuses on deep learning methods applied to biomedical domains, with an emphasis on the diagnosis and prognosis of non-small cell lung cancer (NSCLC). From a methodological standpoint, my work can be divided into three main areas:

- **Medical Foundation Models:** I investigated the application of 3D medical vision foundation models for NSCLC subtype classification by leveraging their embeddings from 3D CT scans, enhancing representation learning [S3].
- **Multimodal Deep Learning:** To investigate the benefits of multimodal deep learning in biomedical research, we reviewed the literature on its use, particularly focusing on the intermediate fusion approach [S1]. Additionally, I implemented a novel intermediate fusion method to combine CT and PET images for the classification of histological subtypes in NSCLC [7, S2].
- **Resilient AI:** I examined the advantages of triplet loss over traditional cross-entropy loss, particularly in scenarios involving small datasets [4]. Furthermore, I investigated federated learning techniques to enhance privacy while expanding dataset sizes by combining data from multiple institutions, also integrating these methods with triplet networks [6].

## Publications


[7] **Aksu, F.**, Gelardi, F., Chiti, A. and Soda, P., 2024, December. Toward a Multimodal Deep Learning Approach for Histological Subtype Classification in NSCLC. In *2024 IEEE International Conference on Bioinformatics and Biomedicine (BIBM)* (pp. 6327-6333). IEEE.

[6] **Aksu, F.**, Cordelli, E., Gelardi, F., Chiti, A., Soda, P., 2024. Enhancing NSCLC Histological Subtype Classification: A Federated Learning Approach Using Triplet Loss. In *3rd International Workshop on Artificial Intelligence for Healthcare Applications (AIHA), 27th International Conference on Pattern Recognition (ICPR)*. **In print.**

[5] **Aksu, F.**, Bria, A., Caragliano, A.N., Caruso, C.M., Chen, W., Cordelli, E., Coser, O., Francesconi, A., Furia, L., Guarrasi, V. and Iannello, G., 2024. Towards AI-driven Next Generation Personalized Healthcare and Well-being. In *Ital-IA 2024, 4th National Conference on Artificial Intelligence, organized by CINI, May 29-30, 2024, Naples, Italy* (pp. 360-365). CEUR-WS.

[4] **Aksu, F.**, Gelardi, F., Chiti, A. and Soda, P., 2023, June. Early Experiences on using Triplet Networks for Histological Subtype Classification in Non-Small Cell Lung Cancer. In *2023 IEEE 36th International Symposium on Computer-Based Medical Systems (CBMS)* (pp. 832-837). IEEE.

[3] Guarrasi, V., Tronchin, L., Caruso, C.M., Rofena, A., Manni, G., **Aksu, F.**, Paolo, D., Iannello, G., Sicilia, R., Cordelli, E. and Soda, P., 2023. Building an AI-enabled metaverse for intelligent healthcare: opportunities and challenges. In *Ital-IA 2023, Italia Intelligenza Artificiale Thematic Workshops, co-located with the 3rd CINI National Lab AIIS Conference on Artificial Intelligence (Ital IA 2023), Pisa, Italy, May 29-30, 2023* (pp. 134-139). CEUR-WS.

[2] **Aksu, F.** and Direkoğlu, C., 2021, June. Lightweigth Convolutional Neural Networks for Person Re-Identification. In *2021 3rd International Congress on Human-Computer Interaction, Optimization and Robotic Applications (HORA)* (pp. 1-5). IEEE.

[1] **Aksu, F.** and Direkoğlu, C., 2020. Person Re-Identification in Surveillance Videos using Deep Learning based Body Part Partition and Gaussian Filtering. Avrupa Bilim ve Teknoloji Dergisi, pp.291-296.


### Submitted works


[S3] **Aksu, F.**, Gelardi, F., Chiti, A. and Soda, P., 2025. NSCLC histological subtype classification from CT scans using generalist 3D medical foundation models. *Submitted to IEEE ICHI 2025*

[S2] **Aksu, F.**, Gelardi, F., Chiti, A. and Soda, P., 2024. Multi-stage intermediate fusion for multimodal learning to classify non-small cell lung cancer subtypes from CT and PET. *Submitted to Pattern Recognition Letters. arXiv:2501.12425*

[S1] Guarrasi, V., **Aksu, F.**, Caruso, C.M., Di Feola, F., Rofena, A., Ruffini, F. and Soda, P., 2024. A Systematic Review of Intermediate Fusion in Multimodal Deep Learning for Biomedical Applications. *Submitted to Information Fusion. arXiv:2408.02686.*


February 11, 2025