Amir Yavariabdi (PhD) | Assistant Professor

Location: Turkey
Nationality: Iranian
Telephone: 0090-5061590507
Email: **amir.yavariabdi@gmail.com**
Scholar: **https://scholar.google.com/citations?user=HxRSmj0AAAAJ&hl=en**
Marital Status: Married (Turkish & EU Citizen)

Education

Feb 2011 – July 2014	**PhD in Medical Image Analysis, University of Auvergne, Clermont-Ferrand, France**

- Thesis: "Mapping Endometrial Implants by Registering Transvaginal Ultrasound to Pelvic Magnetic Resonance Images"
- Supervisor: Prof. Adrien Bartoli and Prof. Chafik Samir

Oct 2009 – July 2010	**MSc in Electronic Systems with Communication, University of Warwick, Coventry, U.K.**

- Thesis: "Obtain Depth from Defocus"
- Supervisor: Prof. Richard Staunton

Sept 2005 – Feb 2009	**BSc in Electrical and Electronics Engineering, Eastern Mediterranean University, Famagusta, Cyprus**

- Thesis: "Real Time Foreground and Background Detection using Gaussian Mixture Model"
- Supervisor: Dr. Erhan Ince

Academic Experiences

January 2024 – Present	**Blekinge Institute of Technology, Computer Science, Karlskrona, Sweden**
	Senior Lecture in Artificial Intelligence and Machine Learning

March 2015 – January 2024	**KTO Karatay University, Mechatronics Engineering Department, Konya, Turkey**
	Assistant Professor, Erasmus+ coordinator

Outline:

As an Assistant Professor, I have excelled in various aspects of academic instruction and research. With a passion for teaching, I have developed comprehensive course materials tailored to meet the evolving demands of the industry. My extensive research experience has equipped me with the ability to devise, advise on, and manage effective learning strategies. I am dedicated to fostering student engagement, motivation, and intellectual development, while also providing guidance and mentorship to students. Moreover, as the department's Erasmus Coordinator, I have also played a pivotal role in facilitating international academic exchange and fostering cross-cultural collaborations within the department and beyond.

Key responsibilities:
1. Designing and developing up-to-date course materials that align with the dynamic requirements of the industry, ensuring students receive relevant and practical knowledge.
2. Establishing and nurturing collaborative research activities, fostering productive partnerships and leveraging collective expertise for innovative and impactful research outcomes.
3. Publishing papers in esteemed international conferences and high-impact journals, showcasing my commitment to rigorous research and knowledge dissemination.
4. Composing patents, securing funds, and crafting project proposals to facilitate the implementation of cutting-edge ideas and innovative solutions.
5. Providing supervision and guidance to undergraduate and postgraduate students involved in research projects and competitions, nurturing their research skills, and promoting their academic growth.

Feb 2009 – July 2009 **Electrical and Electronics Engineering Department**
Eastern Mediterranean University, Famagusta, Cyprus
Research Assistant

Outline:

As a Research Assistant, I played a crucial role in enhancing the educational experience for students. My primary responsibilities involved supervising projects and instructing students on the usage of MultiSIM, a circuit design program, for the Circuit Theory II course. Additionally, I was responsible for the preparation of laboratory materials, designing experiments, assigning tasks, and evaluating student performance. Through my active involvement in the laboratory sessions, I fostered an engaging and supportive learning environment, enabling students to develop strong analytical and problem-solving skills in the field of electrical and electronics engineering.

Key responsibilities:
1. Teaching and demonstrating the utilization of MultiSIM, a circuit design program, for the Circuit Theory II course, enabling students to effectively analyze and simulate complex circuits.
2. Preparing comprehensive laboratory materials, including experiments and assignments, to facilitate hands-on learning experiences.
3. Evaluating student performance, providing constructive feedback, and assessing their understanding of circuit theory concepts based on given assignments.
4. Conducting physical experiments with various electronic circuit elements to demonstrate their practical applications and enhance students' comprehension.

Research Experiences

March 2011 – March 2014 **Advanced Laparoscopy with Computer Vision Laboratory**
Clermont-Ferrand, France
Medical Image Analysis Researcher

Outline:

With a strong background in image segmentation, feature extraction, matching, and registration, I have developed novel methods to accurately map endometrial tissues from 2D ultrasound images to MRI images and 3D organ models, enhancing surgical precision. In summary, my research focused on developing innovative image registration techniques and contributing to high-impact publications. I also performed 3D organ modelling, curve to curve matching, curve to surface matching, and research in multi-modal image fusion. Additionally, I actively participated in knowledge sharing meetings and collaborated with medical professionals in the field.

Key responsibilities:
1. Utilize advanced techniques such as calculus of variations, TPS, and cubic B-splines to develop robust 2D/2D and 3D/2D image registration $methods^1$.
2. Publishing research findings in high-impact journals and conferences.
3. Creating 3D organ models from MRI data to facilitate surgical planning and analysis.
4. Conducting semi-automatic segmentation of 2D organ images from transvaginal ultrasound scans.
5. Researching the fusion of multi-modal pelvic medical images to enhance diagnostic capabilities and treatment planning.
6. Apply numerical approximation methods like FDM and FEM (Hermitian polynomial) to solve image registration challenges and improve surgical accuracy.
7. Attending regular meetings with radiologists and gynecologists to discuss research progress and align objectives with clinical requirements.

Oct 2009 – July 2010 **Image Processing and Expert Systems Lab., School of Engineering**
Warwick University, UK
Computer Vision Researcher

Outline:

As a computer vision researcher, I focused on developing innovative camera calibration techniques and their application in 3D reconstruction through depth from defocus. The aim was to achieve precise and accurate

reconstructions of rigid objects using a single camera, contributing to advancements in computer vision and its practical applications.

Consultancy Experiences

March 2020 – Present **Turk Telekom, Turkey**
Artificial Intelligence Research and Development Consultant

Outline:

As an AI Consultant, my role involves developing advanced algorithms, leading teams, implementing anomaly detection techniques, performing statistical analysis, and providing training and guidance to data scientists. I develop cutting-edge algorithms in Python to model network-related data. My focus is on anomaly detection and KPI tuning using various artificial intelligence methods based on GAN, Gas Neural network, community clustering, isolation forest, graph theory, active semi-supervised learning, One-Class SVM, Local outlier factor, Connectivity-Based Outlier Factor, Cluster-Based Local Outlier Factor, Hidden Markov Model, LSTM, Genetic Algorithm, autoencoders, CNN, etc. Moreover, multiple automating root cause analysis based on statistical methods have been developed.

Key responsibilities:
1. Lead and mentor teams in delivering impactful projects in an ambiguous environment.
2. Develop anomaly detection methods for broadband and GSM data.
3. Create lifetime estimation methods and perform statistical analysis on big data.
4. Implement automatic labelling strategies using active and semi-supervised learning.
5. Conduct workshops and trainings for data scientists at different levels.
6. Manage project planning, team coordination, and product software implementation.

January 2023 – Present **Neurocom, Australia**
Artificial Intelligence Consultant for Money Transaction Monitoring

Outline:
Mentor and lead team to develop a SaaS solution based on machine learning techniques to intelligently monitor money transaction in streaming data.

Key responsibilities:
1. Data collection, synthetic data generation, and visualization.
2. Feature extraction and selection.
3. Developing machine learning models.
4. Test and deployment.

February 2022 – Present **Meliora Academy, Turkey**
Computer Vision Lead Product Developer

Outline:
Develop a computer vision-based game to teach mathematics to fourth-grade students.

Key responsibilities:
1. Real-time ball detection using deep learning object detection algorithms (e.g., YOLO, SAM).
2. Point trajectory estimation (Kalman filter and cubic polynomial regression).
3. Project planning, team management and product software implementation-Delivery focused.

Jan 2021 – November 2021 **AutoDidactic Technologies, Turkey**
Reinforcement Learning Consultant

Outline:
Develop and implement a reinforcement learning-based simulation solution for pilot training, enabling pilots to learn and adapt their behavior in various scenarios.

Key responsibilities:
1. Utilize PPO-based RL algorithm to generate realistic flight scenarios for discrete and continuous data.
2. Work with the team to develop and test RL algorithms specifically tailored for army pilot training.
3. Implement simulations to mimic real-world scenarios and provide an immersive training environment.
4.Continuously assess and improve the simulation solution based on feedback from pilots and trainers.
5.Ensure the successful integration and deployment of the RL solution within the existing infrastructure.

Sept 2019 – March 2020   **Pollen Metrology, France**
Computer Vision and Deep Machine Learning Consultant

Outline:
Develop deep learning and computer vision-based algorithms in Python to analyse nano materials.

Key responsibilities:
1. Develop CNN-based segmentation algorithms to segment nano materials in X-ray images.
2. Develop feature extraction algorithms to extract features in segmented regions.
3. Develop feature-based warping algorithms to model deformations and thus find production faults.

Research Projects

Involved Projects

March 2011 – March 2014   **University of Auvergne, France**
Researcher
- Project: "Mapping Endometrial Implants by Registering Transvaginal Ultrasound to Pelvic Magnetic Resonance Images"
- Funding: EUR 90,000, Funded by the prefect of the Clermont-Ferrand region, France

Grants

June 2016 – July 2018   **KTO Karatay University, Turkey**
Project Leader
- Project: "Square Wire Springs Classification"
- Funding: TL 20,000, Funded by the Yaytek Company, Turkey

May 2015 – Sept 2016   **KTO Karatay University, Turkey**
Project Leader
- Project: "Android Mobile Application for Automated Detection and Counting Sprinkler Pipes"
- Funding: TL 12,000, Funded by the Erhas Pipe and Machinery Equipment Industry Inc, Turkey

Co-Investigator

June 2017– Feb 2018   **KTO Karatay University, Turkey**
Grant writer
- Project: "Smart Technologies Design, Development, and Prototyping Centre"
- Funding: EUR 4.5M, Funded by the Competitive Sector Program, European Union and Ministry of Science, Industry and Technology of Turkey

Skills

Language
- Persian (Native), English (Fluent), Turkish (Fluent), French (Basic)

Computer and Software

- Python, C/C++, MATLAB, ITK/VTK, OpenCV, CUDA, SQL, Apache Hadoop, Casandra, TensorFlow, Keras, PyTorch, Deep learning, Machine learning

Hobbies

- Vertical Farming (Online education)
- Hydroponic Strawberries (Online education)
- Natural Language Processing: Developed a GPT-Davinci-based chatbot to assist students during course registration.

Referring

- Remote Sensing, IEEE Selected Topics on Earth Observation and Remote Sensing, IEEE Geoscience and Remote Sensing Letters, IEEE International Symposium on Biomedical Imaging, International Conference on Biomedical Engineering and Biotechnology, Signal, Image, and Video Processing

Editorial Board

- Special issue of Electronics (ISSN 2079-9292), "Recent Trends in Applications of Artificial Intelligence for Image and Video Analysis", 2021.

Publications and research

Patent (Owner)

1. **A. Yavariabdi** and H. Kusetogullari 2021. Toplu taşıma araçlarında kullanmak üzere termal sisli dezenfeksiyon sistemi. Turkey Patent, 2020/08604, filed June 03, 2020, and issued August 23, 2021.
2. **A. Yavariabdi**, M. H. Arslan, G. Doğan, Y. Ekici, F. M. Asik, Konut türü binaların deprem risk önceliklerinin tespitinde kullanilan geometrik parametrelerin evrişimli sinir ağları ile belirlenmesi yöntemi, Turkey Patent, 2021/021293, filed December 27, 2021, and accepted August 04, 2023.

SCI/SCI-E Journal Papers

1. E. Tekin, H. Kusetogullari, **A. Yavariabdi**, C. Yazici, F. Tokat, B. Darbaz, L. O. Iheme, , E. Bozaba, S. Cayir, G. Solmaz, G. Ozsoy, S. Ayaltı, C. K. Kayhan, U. Ince, and B. Uzel, "Improving Computer-Aided Breast Cancer Diagnosis with Generative Adversarial-based Stain Normalization: A Comparative Analysis of Conventional and Unsupervised GAN Techniques", NPJ Breast Cancer, Submitted 2023.

2. **A. Yavariabdi**, H. Kusetogullari, H. Ertan, E. Aksoy, A. Emre Tiryaki, and İ. Berk Özalp, "A Multi-Head CNN-LSTM Model to Detect Performance Anomalies in Home Subscriber Servers", IEEE Signal Processing Letters, Submitted 2023.

3. **A. Yavariabdi**, H. Kusetogullari, O. Orhan, E. Uray, V. Demir, and T. Celik, "SinkholeNet: A Novel RGB-Slope Sinkhole Dataset and Deep Weakly-Supervised Learning Framework for Sinkhole Classification and Localization", Egyptian journal of remote sensing and space sciences, 2023.

4. E. Tekin, C. Yazici, H. Kusetogullari, F. Tokat, B. Darbaz, L. O. Iheme, **A. Yavariabdi**, E. Bozaba, S. Cayir, G. Solmaz, G. Ozsoy, S. Ayaltı, C. K. Kayhan, U. Ince, and B. Uzel, "Tubule-U-Net: A Novel Dataset and Deep Learning Patch-Based Model for Incomplete and Irregular Tubule of Breast Tissue Segmentation", Nature: Scientific Reports, 2023.

5. **A. Yavariabdi**, H. Kusetogullari, T. Celik, "CARDIS: A Swedish Historical Handwritten Character and Word Dataset", IEEE Access, 2022.

6. A. Cheddad, H. Kusetogullari, A. Hilmkil, L. Sundin, **A. Yavariabdi**, M. Aouache, J. Hall, "SHIBR-The Swedish Historical Birth Records: A Semi-Annotated Dataset", Neural Computing and Applications, 2021.

7. **A. Yavariabdi**, H. Kusetogullari, T. Celik, H. Cicek, "*FastUAV-NET: A Multi-UAV Detection Algorithm for Embedded Platforms*" Electronics, vol. 10, no. 6, 2021.

8. H. Kusetogullari, **A. Yavariabdi**, J. Hall, N. Lavesson, "*DIGITNET: A Deep Handwritten Digit Detection and Recognition Method Using a New Historical Handwritten Digit Dataset*", Big Data Research, vol. 23, 2021.

9. H. Kusetogullari**, A. Yavariabdi**, A. Cheddad, H. Grahn, and J. Hall, *"ARDIS: a Swedish historical handwritten digit dataset"*, Neural Computing and Applications, vol. 32, pp. 16505–16518, 2020.

10. H.Kusetogullari and **A. Yavariabdi**, "*Evolutionary Multiobjective Multiple Description Wavelet Based Image Coding in the Presence of Mixed Noise in Images*", *Applied Soft Computing, vol. 73, pp. 1039-1052,* Dec. 2018.

11. H.Kusetogullari and **A. Yavariabdi**, "*Unsupervised Change Detection in Landsat Images with Atmospheric Artifacts: A Fuzzy Multiobjective Approach*", Journal of Mathematical Problems in Engineering, may 2018.

12. **A. Yavariabdi,** H. Kusetogullari, "*Change Detection in Multispectral Landsat Images Using Multi-Objective Evolutionary Algorithms*", IEEE Geoscience and Remote Sensing Letters, December 2016.

13. **A. Yavariabdi**, A. Bartoli, C. Samir, M. Artigues, D. Da Ines, and M. Canis, "*Mapping and Characterizing Endometrial Implants by Registering 2D Transvaginal Ultrasound to 3D Pelvic Magnetic Resonance Images*", Journal of Computerized Medical Imaging and Graphics (CMIG), Elsevier, June 2015.

14. H. Kusetogullari, **A. Yavariabdi**, and Turgay Celik, "*Unsupervised Change detection in Multi-temporal Multi-spectral Satellite Images using Parallel Particle Swarm Optimization*", IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing (JSTARS), May 2015.

Other Journals (Scopus)

1. V. Demir, E. Uray, O. Orhan, **A. Yavariabdi**, H. Kusetogullari, "Trend Analysis of Ground-Water Levels and The Effect of Effective Soil Stress Change: The Case Study of Konya Closed Basin", European Journal of Science and Technology, vol. 24, pp. 515-522, 2021.

2. **A. Yavariabdi**, H. Kusetogullari, and H. Cicek, "UAV detection in airborne optic videos using dilated convolutions", Journal of Optics, 2021.

International Conference Papers

1. A. Kusetogullari, H. Kusetogullari, **A. Yavariabdi**, J. Eklund, and M. Andersson, "*Genetic Algorithm-based Variable Selection Approach for High-Growth Firm Prediction*", IEEE International Conference on Electrical, Computer, Communications and Mechatronics Engineering, 2022.

2. H. Ertan, **A. Yavariabdi**, S. Ezgi Küçükbay, E. Aksoy, A. Emre Tiryaki, and İ. Berk Özalp, "*Lead-Acid Battery Lifetime Estimation using Limited Labeled Data for Cellular Base Stations*", IEEE Wireless Telecommunications Symposium, 2022.

3. H. Ertan, S. Ezgi Küçükbay, **A. Yavariabdi**, N. Kangöz, A. Emre Tiryaki and İ. Berk Özalp, "*Anomaly Detection on Broadband Network Gateway",* IEEE International Black Sea Conference on Communications and Networking, pp. 1-6, 2020.

4. **A. Yavariabdi**, H. Kusetogullari, E. Mendi, and B. Karabatak, "*Unsupervised Change Detection using Thin Cloud-Contaminated Landsat Images*", IEEE International Conference on Intelligent Systems, Madeira Island, Portugal, September 2018*.*

5. M. F. Demir, A. Cankirli, B. Karabatak, **A. Yavariabdi**, E. Mendi, and H. Kusetogullari, " *Real-Time Resistor Color Code Recognition using Image Processing in Mobile Devices*", IEEE International Conference on Intelligent Systems, Madeira Island, Portugal, September 2018.

6. H. Kusetogullari, **A. Yavariabdi**, "*Self-Adaptive Hybrid PSO-GA Method for Change Detection Under Varying Contrast Conditions on Satellite Images*", *IEEE Int. Science and Information Conf. on Computing*, pp. 361-368, London, UK, 2016.

7. **A. Yavariabdi**, H. Kusetogullari, A. B. Usakli, "*Unsupervised Satellite Change Detection Using Particle Swarm Optimization in Spherical Coordinates*", *International Symposium on Engineering, Artificial Intelligence and Applications (ISEAIA)*, Kyrenia, Cyprus, 2015.

8. **A. Yavariabdi**, C. Samir, and C. Hordonneau, "*Curves-Driven Smooth Deformation Field for Multimodal TVUS-MR Image Registration*", Proceedings of the Medical Image Understanding and Analysis Conference (MIUA), Lincoln, UK, July 2015.

9. **A. Yavariabdi**, C. Samir, A. Bartoli, D. Da Ines, and N. Bourdel, "*Contour-Based TVUS-MR Image Registration for Mapping Small Endometrial Implants*", Proceedings of the Computational and Clinical Applications in Abdominal Imaging at MICCAI (ABD-MICCAI), Nagoya, Japan, September 2013.

10. **A. Yavariabdi**, C. Samir, A. Bartoli, D. Da Ines, and N. Bourdel, "*Mapping Endometrial Implants by 2D/2D Registration of TVUS to MR Images from Point Correspondences*", Proceedings of the IEEE International Symposium on Biomedical Imaging (ISBI), San Francisco, CA, USA, April 2013.

11. **A.Yavariabdi**, C. Samir, and A. Bartoli, "*3D Medical Image Enhancement based on Wavelet Transforms*", Proceedings of the Medical Image Understanding and Analysis Conference (MIUA), London, UK, July 2011.

12. H. Kusetogullari, **A. Yavariabdi**, M. S. Leeson, and E. L. Hines, "*Genetic Algorithm Based Rainbow Network Flow Optimization for Multiple Description Coding in Lossy Networks*", Proceedings of the IEEE International Conference on Internet Technology and Secured Transactions (ICITST), London, UK, pp. 1--6, November 2010.