Dr. Anjith George

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Career Summary

- Over 11 years of experience in computer vision, machine learning, deep learning, and image processing. Strong academic background with expertise in biometrics and deep learning. Committed to understanding and applying advanced concepts in machine learning.

Research Interests

- Computer Vision, Pattern Recognition and Machine Learning, Deep learning, Signal Processing, Biometrics.

Computer Skills

- Python, PyTorch, OpenCV,Git, Unix/Linux/Windows, etc.

Work Experience

- **Research Associate (Idiap Research Institute, Martigny, Switzerland)** : Heterogeneous face recognition, Anti-spoofing, Biometric authentication at a distance, January 2021 - Present.
- **Post Doctoral Researcher(Idiap Research Institute, Martigny, Switzerland)** : Secure face recognition, October 2017- December 2020.
- **Samsung Research Institute Bangalore, India, *SAIT***: Technical Lead, Machine Learning, Feb 2017-September 2017.
- **Algorithm Developer**: in the development of driver alertness monitoring system, June 2010-March 2012.
- **Algorithm Developer**: in the development of emotion recognition system sponsored by samsung GRO Award, 2014.

Education

Indian Institute of Technology (IIT) Kharagpur, India. PhD, Image based Gaze tracking and Activity Recognition, July 2012 — 2017.

Indian Institute of Technology (IIT) Kharagpur, India. M. Tech, Instrumentation Engineering, July 2010 — June 2012

- CGPA: 9.17/10

N S S College of Engineering (University of Calicut), Kerala, India. B. Tech, Electrical and Electronics Engineering,October 2006 — June 2010

- Percentage: 80.26

Research Profile

Research Associate, Idiap Research Institute

- Developing novel strategies for recognition at a distance.
- Development of algorithms for heterogeneous face recognition
- Development of algorithms for face anti spoofing
- Design of framework and software using multi-channel data
- Reproducible algorithms with open source package.

PhD, IIT Kharagpur

- Design and implementation of a low cost eye gaze tracking system for low resolution images
- Development of a novel framework for biometric identification based on eye movements.

- Development of a framework for gaze based activity recognition.

M. Tech, IIT Kharagpur

- **Main Project**: Design and Implementation of Real-time Algorithms for Eye Tracking and PERCLOS Measurement for on board Estimation of Alertness of Drivers

Sponsored Projects

- **Researcher** : "BRIAR: Biometric Recognition and Identification at Altitude Range ", Funded by Intelligence Advanced Research Projects Activity (IARPA), 2022-Present.
- **Researcher** : "HARDENING: Heterogeneous face Recognition for unifieD idENtIty maNaGement", Funded by Innosuisse, 2021-Present.
- **Researcher** : "Biometric Authentification with timeless learner", Funded by Intelligence Advanced Research Projects Activity (IARPA), 2017-2021.
- **Algorithm Developer** : "Design of an Embedded System for On-board Assessment of the Level of Alertness in Human Driver", Funded by Department of Electronics and Information Technology (Ministry of Information Technology) Government of India, 2014.
- **Algorithm Developer** : "Fast Fixed Point Algorithms for identifying Alertness and Emotion", Funded by ***Samsung*** *Advanced Institute of Technology (**SAIT**) Under Global Research Outreach Program (GRO) 2012*.

Awards & Honours

- **Winner**, EFaR 2023, Efficient Face Recognition Competition , Organized by IEEE IJCB 2023.
- **Winner**, BioEye 2015, International Eye Movement based biometrics competition, Organized by IEEE BTAS.
- **Finalist**: Intel India Embedded Challenge 2012.
- **Secured 99.2 and 98.1 percentile** in Electrical engineering GATE 2010 and GATE 2012.
- **MHRD Fellowship** during PhD (2012-2017)
- **MHRD Fellowship** during M Tech (2010-2012)

Journal Publications

- **A. George**, C. Ecabert, H. Otroshi, K. Kotwal, S. Marcel. "EdgeFace: Efficient Face Recognition Model for Edge Devices", *IEEE Transactions on Biometrics, Behavior, and Identity Science.*, 2024.
- **A. George**, A. Mohammadi, S. Marcel. "Prepended Domain Transformer: Heterogeneous Face Recognition without Bells and Whistles ", *IEEE Transactions on Information Forensics and Security*, 2022.
- **A. George**, S. Marcel. "Learning One Class Representations for Presentation Attack Detection using Multi-channel Convolutional Neural Networks ", *IEEE Transactions on Information Forensics and Security*, 2020.
- G. Heusch, **A. George**, D. Geissenbuhler, Z. Mostaani, S. Marcel. "Deep Models and Shortwave Infrared Information to Detect Face Presentation Attacks ", *IEEE Transactions on Biometrics, Behavior, and Identity Science.*, 2020.
- **A. George**, Z. Mostaani, D. Geissenbuhler, O. Nikisins, A. Anjos, S. Marcel. "Biometric Face Presentation Attack Detection with Multi-Channel Convolutional Neural Network", *IEEE Transactions on Information Forensics and Security*, 2019.
- **A. George**, A. Routray, "Fast and Accurate Eye Localisation Algorithm for Gaze Tracking in Low Resolution Images", *IET Computer Vision*, vol. 10, no. 7, pp.660-669, 2016.
- **A. George**, A. Routray, "A score level fusion method for eye movement biometrics", *Pattern Recognition Letters*, Elsevier, vol. 82, pp.207-215, 2016.
- A. Sengupta, A. Dasgupta, A. Chaudhuri, **A. George**, A. Routray, R. Guha,"A Multimodal System for Assessing Alertness Levels due to Cognitive Loading",in *IEEE in Transactions on Neural Systems & Rehabilitation Engineering*, 2017.
- A. Dasgupta, **A. George**, S. L. Happy, A. Routray, "A Vision Based System for Monitoring the Loss of Attention in Automotive Drivers", in *IEEE Transactions on Intelligent Transportation Systems*, vol. 14, no. 4, pp.1825-1838, 2013
- A. Dasgupta, **A. George**, S. L. Happy, A. Routray, Tara Shanker, "An on-board vision based system for drowsiness detection in automotive drivers", in *International Journal of Advances in Engineering Sciences and Applied Mathematics, Springer, Special Issue on Advanced Traffic and Transportation Systems*, vol. 5,

no. 2-3, pp. 94-103, 2013.

Book Chapters and Research Reports

- **A. George**, S. Marcel , "Multi-channel Face Presentation Attack Detection Using Deep Learning". *Deep Learning-Based Face Analytics*. Springer, Cham, pp. 269-304, 2021.
- A. Sengupta, **A. George**, A. Dasgupta, A. Chaudhuri, B. Kabi, A. Routray , "Alertness monitoring system for vehicle drivers using physiological signals". *Handbook of Research on Emerging Innovations in Rail Transportation Engineering*. IGI Global, pp. 273-311, 2016.
- **A. George**, S. Marcel, "Can Your Face Detector Do Anti-spoofing? Face Presentation Attack Detection with a Multi-Channel Face Detector". *Idiap Research Reports*, 2020.
- Z. Mostaani, **A. George**, G. Heusch, D. Geissenbuhler, S. Marcel. "The High-Quality Wide Multi-Channel Attack (HQ-WMCA) database", *Idiap Research Reports*, 2020.

Selected Conference Publications

- **A. George**, S. Marcel. "Heterogeneous Face Recognition Using Domain Invariant Units",*IEEE ICASSP 2024*.
- **A. George**, S. Marcel. "Cross Modal Focal Loss for RGBD Face Anti-Spoofing",*IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2021.
- **A. George**, S. Marcel. "Bridging the Gap: Heterogeneous Face Recognition with Conditional Adaptive Instance Modulation",*International Joint Conference on Biometrics (IJCB 2023), IEEE (Accepted)*, 2023.
- **A. George**, S. Marcel. "On the Effectiveness of Vision Transformers for Zero-shot Face Anti-Spoofing",*International Joint Conference on Biometrics (IJCB 2021), IEEE. (Accepted)*, 2021.
- **A. George**, S. Marcel. "Deep Pixel-wise Binary Supervision for Face Presentation Attack Detection",*ICB, International Conference on Biometrics* 2019, IEEE.
- O. Nikisins, **A. George**, S. Marcel. "Domain Adaptation in Multi-Channel Autoencoder based Features for Robust Face Anti-Spoofing", *ICB, International Conference on Biometrics* 2019, IEEE.
- **A. George**, A. Routray, "Real-time Eye Gaze Direction Classification Using Convolutional Neural Network", *SPCOM, International Conference on Signal Processing and Communications, IEEE*, pp. 1-5, 2016.
- A. Dasgupta, A. Mandloi, **A. George**, A. Routray, "An Improved Algorithm for Eye Corner Detection", *SPCOM, International Conference on Signal Processing and Communications, IEEE* , pp. 1-4, 2016.
- A. Morales, J. Fierrez, M. Gomez-Barrero, J. Ortega-Garcia, R. Daza, J.V. Monaco, J. Montalvão, J. Canuto, **A. George**, "KBOC: Keystroke Biometrics OnGoing Competition", *IEEE Eighth International Conference on Biometrics: Theory, Applications, and Systems*, BTAS, pp. 1-6, 2016.
- Z. Emersic, D. Stepec, V. Struc, P. Peer, **A. George**, A. Ahmad, E. Omar, T. E. Boult, R. Safdari, Y. Zhou, S. Zafeiriou, D. Yaman, F. I. Eyiokur, H. K. Ekenel. "The Unconstrained Ear Recognition Challenge", *International Joint Conference on Biometrics*, IJCB, 2017.
- G. Banik, P. Patnaik, **A. George**, A. Routray, "Contextual Priming and Perception Manipulation: An Exploration through Eye-Tracking and Audience Response", *NAOP Convention 2016, Allahabad*.
- SL Happy, A. Dasgupta, **A. George**, A. Routray, "A video database of human faces under near Infra-Red illumination for human computer interaction applications", *International Conference on Intelligent Human Computer Interaction (IHCI)*, IEEE, 2012.
- SL Happy, **A. George**, A. Routray, "A real time facial expression classification system using Local Binary Patterns", *International Conference on Intelligent Human Computer Interaction (IHCI)*, IEEE, 2012.

Patents

- "A SYSTEM FOR REAL-TIME ASSESSMENT OF ALERTNESS LEVEL OF HUMAN BEINGS", A. Routray, A. Dasgupta, **A. George**, SL Happy, *634/KOL/2013*, IN, 2013
- "APPARATUS AND METHODS FOR IDENTIFYING ANOMALY(IES) IN RE-CHARGEABLE BATTERY OF EQUIPMENT AND CONNECTED COMPONENT(S)", Filed, 2018, Jointly with Samsung.
- "HETEROGENEOUS FACE RECOGNITION SYSTEM AND METHOD", A. George, S. Marcel, Filed, 2023, Jointly with FaceAdapter.

Activities

- Member IEEE
- Member IEEE Biometrics Council
- Member, COGAIN