Kushal Vangara

kushal-vangara.github.io

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I am a Ph.D. candidate in my final semester, specializing in responsible AI, machine learning, computer vision, biometrics, computational psychology, and cybersecurity.

EDUCATION

Ph.D. in Computer Science May 2025 (Expected)
Florida Institute of Technology, Florida, USA
Dissertation: Indirect Personality Prediction through Non-Verbal Cues Analysis in Videos
Advisor: Dr. Michael C. King

M.S. in Information Assurance & Cybersecurity May 2018
Florida Institute of Technology, Florida, USA
Thesis: Transfer Learning with Convolutional Neural Networks (CNNs) Applied to Periocular Biometrics
Advisor: Dr. Michael C. King

B.Tech. in Electronics and Communications Engineering July 2014
Jawaharlal Nehru Technological University, Hyderabad, India
Projects: Developed IoT automation and prototyping solutions using Arduino and Raspberry Pi

PROFESSIONAL EXPERIENCE

Graduate Research Assistant
Florida Institute of Technology, FL, USA May 2018 – present
– Researched face recognition systems, applied computer vision methods, trained ML models, curated datasets, data processing, and analysis.

Volunteer Research Assistant
Florida Institute of Technology, FL, USA Jan 2016 – Dec 2017
– Designed and developed portable biometric systems using Raspberry Pi and Kinect, analyzed security vulnerabilities, and benchmarked CPU architectures.

Internship
TalentSprint, Hyderabad, India Jan 2015 - July 2015
– Built an E-Billing web application leveraging Java, Spring Framework, and SQL database with an MVC-based scalable design.

Embedded Systems Intern
Potential Labs, Hyderabad, India July 2014 - Dec 2014
– Designed and tested electronic circuits, PCB, and IoT solutions.

TEACHING EXPERIENCE

Teaching Assistant
Florida Institute of Technology, FL Spring 2025
– Assisted in teaching a graduate Cyber Identity course (*CSE-5800*), including materials, assignments, and assessments.

Teaching Assistant
Florida Institute of Technology, FL Fall 2024
– Developed and taught graduate-level biometrics course (*CYB-5677*), including creating materials, assignments, and exams while conducting assessments and evaluating student performance.

PROJECTS

Computational Psychology 2021–2025

- Designed and implemented protocols to create rich, naturalistic datasets, capturing personality traits through individual differences in speech, body gestures, and physical movements. Researched and developed spatiotemporal machine learning models and computer vision methods to detect and analyze visual cues like body motion, facial micro-expressions, and hand gestures for passive personality assessment.

Long-Range Biometric Identification 2022–2023

- Contributed to modules addressing atmospheric, motion, and resolution challenges for real-time whole-body biometric identification at long ranges. Curated a diverse indoor/outdoor dataset with contextual attributes such as skin tone to enhance biometric research.

GAN-Based Synthetic Content Detection 2020–2021

- Researched Generative Adversarial Networks (GANs) to produce synthetic faces and detect adversarial content, contributing to techniques that counter deceptive or falsified media in online platforms.

Person Re-identification 2019

- Analyzed visual attributes (e.g., soft identifying features) and evaluated advanced sensor technologies (e.g., cross-spectral and multispectral systems) to enhance person re-identification accuracy in congested, real-world video environments and developed a conceptual research framework.

Face Recognition Research 2018–2020

- Investigated bias in face recognition systems, identifying root causes and developing mitigation strategies to enhance fairness across demographics (race, age, and gender). Explored the impact of image properties and training data diversity on false match rates, improving algorithmic fairness using Deep Convolutional Neural Network models.

RESEARCH PRESENTATIONS

Invited Presentation Sep 2023

Center for Advanced Manufacturing and Innovative Design (CAMID) Melbourne, FL

– Presented a poster at the Computational Cybersecurity in Compromised Environments (C3E) workshop, titled: *"Deep Learning-Based Personality Trait Analysis from Facial Expressions."*

Invited Presentation Feb 2020

University of North Carolina Wilmington Wilmington, NC

– Invited to present at the Cyber Identity and Behavior Analytics Research Consortium workshop, titled: *"Facing Off with Deep Fakes."*

Invited Presentation Dec 2016

Thales USA Orlando, FL

– Invited to present at the Thales Project Arduino Showcase, titled: *"Enhanced Space Navigation and Orientation Suit."*

TECHNICAL SKILLS

Programming	Python (*numpy, pandas, scikit-learn*), Deep Learning (*PyTorch, Tensorflow, JAX*), OpenCV, R, C/C++, MATLAB, Bash
Big Data	Accelerated Computing (*CUDA, HPC*), Parallel Processing, Cloud Computing (*AWS/SageMaker, GCP*), Database (*SQL*)
DevOps	Git/Github, Docker, Workflow Management (*MLFlow, Airflow*), Testing, CI/CD, Open Source
Data Visualization	Matplotlib, Seaborn, Plotly, Graphana, Tableau
Languages	Proficient in English, Hindi and Telugu

PUBLICATIONS

- **Kushal Vangara**, Gabriella Pangelinan, Xavier Merino, Gary Burns, and Michael King "Beyond the Smile: Predicting Personality from Facial Movements Using AI". in: *Society for Industrial and Organizational Psychology Annual Conference*. (Accepted). Apr. 2025

- **Kushal Vangara**, Gabriella Pangelinan, Xavier Merino, Gary Burns, and Michael King "Indirect Assessment of Personality from Facial Expressions". In: *Society for Personality and Social Psychology Annual Convention*. (Accepted). 2025

- Cody E Harrell, Gary N Burns, Michael C King, William B Ridgway, **Kushal Vangara**, Zachary B Hesson, Vanessa A Edkins, and Charles A Morgan "Investigating the overlapping concepts of the Dark Core and the General Factor of Personality". In: *Personality and Individual Differences* 225 (2024), p. 112650. ISSN: 0191-8869

- Gabriella Pangelinan, KS Krishnapriya, Vitor Albiero, Grace Bezold, Kai Zhang, **Kushal Vangara**, Michael C King, and Kevin W Bowyer "Exploring Causes of Demographic Variations In Face Recognition Accuracy". In: *Computer Vision: Challenges, Trends, and Opportunities* (2024), p. 61

- Gabriella Pangelinan, Xavier Merino, Samuel Langborgh, **Kushal Vangara**, Joyce Annan, Audison Beaubrun, Troy Weekes, and Michael C King "The CHROMA-FIT Dataset: Characterizing Human Ranges of Melanin for Increased Tone-Awareness". In: *Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) Workshops*. Jan. 2024, pp. 1170–1178

- Kevin W Bowyer, Michael C King, Walter J Scheirer, and **Kushal Vangara** "The "Criminality From Face" Illusion". In: *IEEE Transactions on Technology and Society* 1.4 (2020), pp. 175–183

- Vitor Albiero, KS Krishnapriya, **Kushal Vangara**, Kai Zhang, Michael C King, and Kevin W Bowyer "Analysis of gender inequality in face recognition accuracy". In: *Proceedings of the IEEE Winter Conference on Applications of Computer Vision Workshops*. 2020, pp. 81–89

- KS Krishnapriya, Vitor Albiero, **Kushal Vangara**, Michael C King, and Kevin W Bowyer "Issues related to face recognition accuracy varying based on race and skin tone". In: *IEEE Transactions on Technology and Society* 1.1 (2020), pp. 8–20

- Vitor Albiero, Kevin Bowyer, **Kushal Vangara**, and Michael King "Does face recognition accuracy get better with age? Deep face matchers say no". In: *The IEEE Winter Conference on Applications of Computer Vision*. 2020, pp. 261–269

- KS Krishnapriya, **Kushal Vangara**, Michael C King, Vitor Albiero, and Kevin Bowyer "Characterizing the variability in face recognition accuracy relative to race". In: *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition Workshops*. 2019, pp. 0–0
- Tiziano Bernard, Andrea Gonzalez, Vincenzo Miale, **Kushal Vangara**, Lucas Stephane, and Winston E Scott "Haptic feedback astronaut suit for mitigating extra-vehicular activity spatial disorientation". In: *AIAA SPACE and Astronautics Forum and Exposition*. 2017, p. 5113

MAJOR COLLABORATORS

- Dr. Kevin Bowyer from the University of Notre Dame
- Dr. Charles A. Morgan III from the University of New Haven
- Dr. Mark Liberman from Linguistic Data Consortium, University of Pennsylvania
- Dr. Vanessa A. Edkins, Emeritus Faculty, Florida Institute of Technology

REVIEWS

- IEEE Winter Conference on Applications of Computer Vision (WACV)
- Workshop on Demographic Variations in Performance of Biometrics and Related Technology (DVPBA)
- ACM Transactions on Privacy and Security (TOPS)

PROFESSIONAL AFFILIATIONS

- IEEE
- ACM
- SPSP
- EAB
- ARRL (*Call Sign: KQ4YAG*)