RAHUL NAIR

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My research goal is to evaluate how ready AI models are for the end-user. I examine the root cause of algorithmic biases in vision and language models. My recent work focuses on designing novel metrics and benchmarks to identify when AI models reduce or worsen training data biases.

Education

Arizona State University — Tempe, Arizona
Doctor of Philosophy, Computer Science (GPA:- 4.00 / 4.00) — *Aug 2022 - Present*

Amrita University — Coimbatore, India
Bachelor of Technology, Computer Science (GPA:- 9.12 / 10.00) — *Jul 2016 - Jun 2020*

Research Experience

Graduate Research Assistant | Advisor: Dr. Hannah Kerner — Jan 2023 - Present
Arizona State University — *Tempe, USA*
Algorithmic Biases in Vision and Language

- Created DPA and DPAC, two state-of-the-art bias amplification metrics. With DPA and DPAC, users can measure when their models worsen training data biases in image classification and captioning models.
- Investigated geographic biases in driving datasets. We found that classification errors (and not localization errors) account for over 60% of the geographic biases in instance segmentation models.

Research Fellow | Advisor: Dr. Ravi Kiran S — Aug 2021 - Aug 2022
International Institute of Information Technology — *Hyderabad, India*
Segmentation in Unstructured Roads

- Led the data curation of a 1000-hour video repository of unstructured driving scenes. We curated this dataset to advance autonomous driving research in challenging driving conditions in India.
- Created a universal pipeline to semi-automate semantic, instance, and panoptic segment annotations for the dataset, reducing annotation time by 30%.

Work Experience

Research Scientist Intern — May 2025 - Aug 2025
2nd Set AI Corp. — *NY, USA*
Responsible AI

- Developed an algorithm using MLLMs and face identification models to identify if image generation models can replicate copyrighted assets. Our algorithm was more than 96% accurate in flagging copyright issues.
- Working on Face-Edit bench, a benchmark to study if image editing models can preserve facial identity when they sequentially edit a person's face. This benchmark will forward research in controllable face editing.

Research Engineer — Dec 2019 - Mar 2021
International Institute of Information Technology — *Hyderabad, India*
Video Survellaince and Sports Analytics

- Built an adaptive template-matching system to track military tanks for the Indian Defense Ministry. Our tracker was 66% faster and just as accurate as popular deep learning trackers.
- Developed a player tracking algorithm for badminton matches using key-point detection. We deployed this algorithm in a popular badminton league to show players' performance statistics.

Publications and Patents

- Bhanu Tokas*, **Rahul Nair***, Hannah Kerner. "DPA: A One-Stop Metric to Measure Bias Amplification in Classification Datasets." To appear in NeurIPS 2025 [LINK].
- **Rahul Nair***, Bhanu Tokas*, Hannah Kerner. "A Woman with a Knife or A Knife with a Woman? Measuring Directional Bias Amplification in Image Captions." To appear in WACV 2026 [LINK]
- **Rahul Nair**, Bhanu Tokas, Esther Rolf, Gabriel Tseng, Hannah Kerner. "Classification Drives Geographic Bias in Street Scene Segmentation." CVPR 2025 Workshops [LINK]
- **Rahul Nair**, Mukesh N Chugani, T Senthil Kumar. "MetaData: A Tool to Supplement Data Science Education for the First Year Undergraduates" Proceedings of the 8th International Conference on Information and Education Technology 2020. [LINK]
- System and Method for Detecting and Tracking Objects at Midrange using Deep Learning Model. **Indian Patent Published**

SERVICE

- Co-organized a weekly reading group on algorithmic biases at Arizona State University.