

Sonaal Kant

LinkedIn: [sonaal-kant-03b707103/](https://www.linkedin.com/in/sonaal-kant-03b707103/)

Github: github.com/sonaalKant

Email: sonaal@cs.umd.edu

Kaggle: [kaggle/sonaalkant](https://kaggle.com/sonaalkant)

Mobile: (240)-726-9150

SUMMARY OF QUALIFICATION

- **Software and Languages:** C++, C, Python, JAX, Java, SQL, Bash, Spark, Hive, MATLAB, CUDA, TensorRt, ONNXRt, Flask, React Native, TensorFlowJS
- **Tools & Frameworks:** Pytorch, TensorFlow, Keras, Kubernetes, OpenCV, ROS, Slurm, Docker, Git, JIRA, PostgreSQL, MySQL, scikit-learn, Numpy, AWS, GCP, Azure

EDUCATION

- **University of Maryland** Maryland, USA
MS, Computer Science *Aug 2021 - May 2023*
- **Maharaja Agrasen Institute of Technology** Delhi, India
Bachelor of Technology - Information Technology *July 2013 - June 2017*

EXPERIENCE

- **Research Assistant** Maryland, USA
Dept. of Computer Science, University of Maryland *Aug 2021 - Present*
 - Lead the design and development of a high-performance test server that managed predictions across multiple GPUs, reducing inference time by 10x through the use of SLURM. Responsible for maintaining the server and collaborating effectively with cross-functional teams.
- **Applied Scientist Intern** Palo Alto, CA
Amazon *May 2022 - Aug 2022*
 - Developed a deep learning pipeline for body measurement estimation using monocular RGB image, utilizing self-supervised learning in the first phase and a simple regressor to map 3D body vertices to measurements in the second phase. Achieved a TP90 mean error of 1.08 inches in a 3-month period, in comparison with the supervised baseline with a 0.90-inch error.
- **Lead Data Scientist** Gurgaon, India
ParallelDots, Inc. *Aug 2017 - Aug 2021*
 - Developed a custom RetinaNet model from scratch to accurately detect small and fine-grained objects placed in close proximity. Incorporated Gaussian Mixture Model as a post-processing step to further improve detection results.
 - Designed and implemented an end-to-end pipeline for SKU detection on shelves, including both in-domain and out-of-domain object classification. Optimized the pipeline for mobile deployment, achieving real-time performance and high accuracy.
 - Implemented the High-Speed Kernelized Correlation Filter from scratch to track objects in video footage of users applying L'Oréal's mascara product. Successfully created a pipeline that successfully analyzed 100 videos per month with minimum 90% accuracy.
 - Build an end to end pipeline for training, experiment design, ablation studies, and deployment with the CI/CD processes which automated deployment, feedback loops and enabled fast product iterations.
 - Led the Smart Gaze product from ground up, this include building machine learning algorithms for feature matching to successfully deploying and maintaining accuracy in production. This product became the highest revenue stream for the company as we were able to achieve more than 95% accuracy for 10,000+ videos per month.
- **Research Associate** Delhi, India
Indraprastha Institute of Information Technology *Mar 2018 - Mar 2019*
 - Collaborated with Dr. Anubha Gupta on a project to detect bone marrow cancer (Myeloma) using microscopic images of white blood cells. Successfully designed and implemented a Hidden Markov Model baseline to achieve accurate cancer diagnosis which was later improved by incorporating signal processing (DCT) features in deep learning model.

PROJECTS

- **Structure from motion (3D Reconstruction, Machine Learning)::** Reconstruct a 3D scene and simultaneously obtain the camera poses of a monocular camera with traditional machine learning approach and compared it with deep learning approach SFMLearner which was also trained from scratch.
- **Autonomous Vehicle (Object Tracking) :** Implemented an extended Kalman filter for multi-target tracking by fusing camera and LiDAR detections. Designed and integrated measurement models for both sensors, and created modules for track management and data association. Used visualization techniques to evaluate tracked objects and gained hands-on experience with sensor fusion challenges using real-world datasets.

PUBLICATIONS

- * **Kant, Sonaal.** "Learning Gaussian Maps for Dense Object Detection." *Proceedings of the British Machine Vision Conference (BMVC), 2020.*[PDF]
- * Srikrishna, **Sonaal Kant**, and Muktabh Mayank Srivastava. "Benchmark for generic product detection: A low data baseline for dense object detection." *International Conference on Image Analysis and Recognition. Springer, Cham, 2020.*[PDF]
- * **Kant, S.**, Mourya, S., Kumar, P., Gupta, A., Gupta, R. (2018). LeukoNet: DCT-based CNN architecture for the classification of normal versus Leukemic blasts in B-ALL Cancer. arXiv preprint arXiv:1810.07961.[PDF]