

# Sriram Krishnaswamy

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## Education

**Ph.D. Mechanical Engineering** | *December 2019* | The Ohio State University

**M.S. Mechanical Engineering** | *May 2016* | University of Florida

**M.Sc (Hons.) Chemistry and B.E. (Hons.) Mechanical Engineering** | *May 2014* | BITS Pilani

## Skills, Expertise & Abilities

- Python. Libraries: *numpy, pandas, seaborn, tensorflow, flask*
- C, C++. Libraries: *Boost, OpenCV, ROS*
- SQL. Databases: *MySQL, Oracle*
- MATLAB/Octave
- Basic HTML/CSS/JavaScript
- Shell (Bash) Scripting
- Machine Learning/Data Mining
- Data Structures and Algorithms
- Process and quality control
- Statistical Modeling
- Git
- Linux/Windows/macOS

## Professional Experience

**Software Research Scientist** | *Intel Corporation*

Computational Modeling and Technology | *Aug '21 - present*

- **Technical Expertise:** Proficient in C++ and Python, specializing in computational geometric algorithms used in OPC and ILT for semiconductor lithography mask generation and optimization.
- **Capability Development:** Worked with cross-functional teams to develop new capability for creating and representing curvilinear polygons in continuous space.
- **Algorithm Improvement:** Led initiatives that reduced variability in the generation of ILT masks by implementing improved manhattanization schemes. Additionally, identified improved the variability across the chip by implementing efficient solutions to choose the best correction for key geometric patterns.
- **Research support and Collaboration:** Experienced in continuously optimizing tools and infrastructure to expedite highly demanding, dynamic research. Collaborated effectively with the customer team to meet stringent tapeout deadlines. Presented talks on research projects for the entire department.

**Process Integration and Yield Engineer** | *Intel Corporation*

TMI Integration Engineering | *Feb '20 - Aug '21*

- **Process Control Improvement:** Employed statistical modeling and data mining to identify and rectify variations in process control across diverse parameters for all high-volume Intel semiconductor process technology nodes. Also, served as the on-call engineer to disposition material costing millions of dollars.
- **Automation and Monitoring:** Developed and maintained automation systems and scripting tools using Python and JSL to create dashboards for yield improvement and performance-critical parameters.
- **Collaboration and Knowledge Sharing:** Spearheaded a scripting workgroup to facilitate knowledge exchange to develop small-scale systems for enhanced engineering efficiency.

## Academic Research & Projects

### Grad. Research Assistant (Doctorial) | *The Ohio State University*

#### Lab for Autonomous Data Driven Complex Systems | Aug '16 – Dec '19

- **Tensor Framework Development:** Developed a computationally efficient tensor framework for data association in multi-target tracking using the Extended Kalman Filter (EKF) in MATLAB. Primary goal was to simulate the two-body problem for tracking dense space debris in Low Earth Orbit (LEO). *This was the major focus of my doctoral dissertation.*
- **Multi-Agent Test Bed Development:** Developed a multi-agent network using Kobuki bots, Python, and ROS, integrating data from RGB, depth, and laser sensors for localization.
- **Machine Learning Application in Tracking:** Formulated the data association problem in machine learning to work with the tensor decomposition framework.

### Student Assistant | *University of Florida*

#### Stochastic Systems Lab | Nov '14 – May '16

- **Weather Uncertainty Forecasting:** Employed utilizing tensor decomposition and Lorenz models in C++ (with Boost) and MATLAB.
- **Parallelized Numerical Solver Computation:** Adapted a numerical solver for the Fokker-Planck equation and used OpenMP and MPI to parallelize it.
- **Reservoir Failure Simulation:** Simulated a reservoir failure model using chance-constrained optimization in MATLAB.

## Key Awards

- **CMT Departmental Award** for enabling continuous curvilinear geometric representations of curvilinear polygons for mask tapeout.
- **CMT Departmental Award** for improving the exploration algorithm that identifies best patterns and solutions in a mask to work with curvilinear patterns.
- **CMT Departmental Award** for creating the first working prototype of manhattanized “curvilinear” sub-resolution assist features (SRAFs) during ILT mask creation.
- **LTD Divisional Award** for contributions towards protecting quality during multiple heavy fab impacts.
- **CMT Departmental award** for delivering optimized recipe with a quick turnaround for OPC/ILT mask creation for cutting edge lithography for the implant layer in the semiconductor manufacturing process.

## Key Publications

- Krishnaswamy, S., & Kumar, M. (2019). Tensor decomposition approach to data association for multitarget tracking. *Journal of Guidance, Control, and Dynamics*, 42(9), 2007-2025.
- Krishnaswamy, S., & Kumar, M. (2019). A window-based tensor decomposition approach to data-association for multi target tracking. *2019 American Control Conference (ACC)* (pp. 5148-5153). IEEE.
- Krishnaswamy, S., & Kumar, M. (2020). A Machine Learning Based Data Association Approach for Space Situational Awareness. *AIAA 2020-1375. AIAA SciTech Forum*.