Vignesh Vittal-Srinivasaragavan

Phone: +1 (518) 961-8823
E-mail: vickyragav95@gmail.com
Website: vickyragav95.github.io/

Profile Summary

A graduate student with strong research background in computation and applied mathematics complimented with proven/tested software development skills

Education

Rensselaer Polytechnic Institute, New York, USA — *Aug '17 – Dec '22 (expected)*
PhD in Mechanical Engineering — *GPA 3.84/4.00*

Indian Institute of Technology Madras, Chennai, India — *Aug '12 – Jul '17*
B,Tech/M.Tech. in Mechanical Engineering (Product Design) — *GPA 8.38/10.00*
Minor: Industrial Engineering — *Major GPA 8.61/10.00*

Research Projects

• **Accelerator-enabled non-uniform mesh procedures for PIC simulations targeting plasma-surface interaction** — *Jul '19 – Present*
PhD Thesis – Guide: Dr. Onkar Sahni, RPI
- Developed an implicit block-structured non-uniform mesh library, PUMImbbl, to be employed in massively parallel plasma sheath simulations
- Designed particle-tracking algorithms on non-uniform mesh emulating performance of uniform grids while also opening up the possibility to simulate non-convex plasma domains
- Realized 10x reduction in sheath simulation run-times due to 1000x savings in mesh element count
- Developed robust mesh control workflow for the first-of-its-kind massively parallel impurity transport simulations on unstructured meshes
- Simulated a high-fidelity impurity migration in thermo-nuclear fusion reactors by coupling impurity transport model with sheath simulator model

• **Wavelet methods for engineering PDE systems** — *Aug '16 – May '17*
Master's Thesis – Guide: Dr. Raju Sethuraman, IIT Madras
- Performed extensive research on Wavelet-Galerkin finite-element methods for PDE systems
- Developed custom MATLAB codes for efficient implementation of wavelet-FEM solver
- Investigated the effects of wavelet genus and resolution on convergence and stability of the solutions

• **Modeling, Simulation and Control of a Robot** — *Dec '14 – Aug '16*
- Reverse engineered a robot, created a 3-D model and developed a path planning algorithm
- Designed control systme module in SIMULINK to ensure precise and accurate path adherence
- Coupled the custom MATLAB codes with ADAMS dynamic analysis software for co-simulation
- Validated the coupled model with various user-defined input paths

Industrial Experience

• **Winter Intern, Forbes Marshall Ltd.** — *Dec '15 – Jan'16*
- Developed software model to estimate concentration factor of a evacuated tube collector
- Carried out Monte Carlo simulations to estimate optimal geometric design parameters

• **Summer Intern, GE India Pvt. Ltd, Transportation division** — *May '15 – Jul'15*
- Investigated sources of noise and heat emissions in GE locomotive engines
- Researched and presented cost-effective noise mitigation and heat screening options
- Developed a Requirement Traceability Matrix (RTM) for carrying out tests on a lube oil pump rig

Skills

• **Programming** : C/C++, Python, MATLAB
• **HPC** : Kokkos, OpenMP, Pthreads, MPI, CUDA
• **Modelling/Analysis** : Solidworks, Paraview, ANSYS
• **Documentation/Desing** : LaTeX, Doxygen , Inkscape

Publications

• ADAMS-MATLAB Co-Simulation of A Serial Manipulator, Tejaswin Parthasarathy, Vignesh Srinivasaragavan, Soundarapandian Santhanakrishnan. MATEC Web Conf. 95 08002 (2017)