Vignesh Vittal-Srinivasaragavan

Graduate Student

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

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EDUCATION

PhD in Mechanical Engg

Rensselaer Polytechnic Institute

Cumulative GPA: **3.81**/4.0 *Aug '17 - Present*

Relevant Coursework:

Machine learning with data, Computational fluid dynamics, Uncertainty quantification, Inverse uncertainty quantification, Parallel computing

B.Tech/M.Tech in Mechanical Engg

Indian Institute of Technology, Madras

Thesis: Wavelet methods for PDEs in engineering

Cumulative GPA: **8.38**/10.0 *Aug '12 - Jul '17*

Relevant Coursework:

Finite element analysis, Computational structural dynamics, Variational principles in mechanics

PROJECTS

Implicit non-uniform mesh for large-scale scrape-off layer simulations

Dr. Onkar Sahni, RPI

Dr. Davide Curreli, UIUC *July '19 - Present*

- Developed PUMI-MBBL, an implicit block-structured mesh library for scrape-off layer simulation
- Optimized particle locate APIs and achieved close to 100x speedup for a large-scale plasma simulation
- Implemented higher order b-spline based charge schemes to address noise in non-uniform mesh

Wavelet finite element methods for partial differential equations

Dr. Raju Sethuraman, IITM *Aug '16 - May '17*

- Performed detailed research on Wavelet-Galerkin finite element methods for PDE systems
- Developed custom MATLAB codes for the same and showed excellent convergence in solution
- Investigated effect of wavelet genus and resolution on converegence and stability of the solution

Virtual simulation environment for serial manipulator

Dr. Soundarpandian S, IITM *Dec '14 - Aug '15*

- Developed a 3D path planning algorithm for serial manipulator by coupling ADAMS dynamic analysis software and MATLAB
- Intergrated control algorithms Simulink to ensure accurate path adherence

EXPERIENCE

Winter Internship *Dec '15- Jan '15*

Forbes Marshall Pvt. Ltd

- Mathematically modelled the concentration factor of a Fresnel-type evacuated tube collector in terms of input design parameters
- Estimated optimal parameter set by performing a Monte-Carlo simulation of the model

Summer Internship *May '15- July '15*

GE India Pvt. Ltd (Transportation)

- Conducted detailed research on the topic and suggested possible noise mitigation and heat screening methods for GE engines
- Developed a requirement tracebaility matrix for lube oil pump test rig

PUBLICATIONS AND CONFERENCES

ADAMS-MATLAB co-simulation of serial manipulator

Matec Web of Conferences 2017

VMS-based error estimation & adaptivity in joint physical and stochastic space

World Congress in Computational Mechanics 2018

Non-uniform mesh based hPIC code for efficient scrape-off-layer computation

APS Division of Plasma Physics 2019

Improving performance and extending simulation domain of hPIC particle-in-cell code by incorporating PUMI based non-uniform mesh

Bulletin of the American Physical society 2020

SKILLS

- **Programming Languages**
  C, C++, Python, MATLAB
- **High-performance computing**
  OpenMP, Pthreads, MPI, CUDA
- **Modelling/Analysis**
  Solidworks, AutoCAD, Paraview, ANSYS
- **Documentation/Design**
  LATEX, Doxygen, Inkscape