Sooraj Raj

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Education

Master of Science in Aerospace Engineering *May 2016*
University of Illinois at Urbana-Champaign **GPA: 3.17/4.00**
(Average GPA for last 3 semesters: **3.65**)

Bachelor of Technology in Mechanical Engineering *Jul 2012*
National Institute of Technology Calicut (NITC), Calicut, India **GPA: 8.25/10.0**

Skills

Programming Languages: C++, Python, FORTRAN, Mathematica, HTML
Computational Tools: FLUENT, ANSYS, ABAQUS, X-FOIL, PROFOIL, MATLAB
Operating systems and others tools: Microsoft Windows and Linux, Google Cloud, git
Report generating and data processing tools: Microsoft Word, Excel, PowerPoint, LATEX

Relevant Research-work and Projects

2D Game Engine *Feb 2017 –*
- 2D game engine for a top-down stealth game in C++

Numerical Analysis of 3-D Nonlinear Quasi Compressible Flow *Apr – May 2016*
- Programmed a solver in FORTRAN using directionally split piecewise linear advection and Strang splitting
- Used Texas Advanced Computing Centre's XSEDE Supercomputing facility
- Parallelized the code to run on 14 cores using OpenMP

Numerical Analysis of Unsteady, 1-D Homentropic Flow *Oct – Nov 2015*
- Wrote a FORTRAN routine to implement the inverse, interior point algorithm for the method of characteristics analysis

Numerical Analysis of Acoustic Wave Propagation in 1-D *Apr – May 2015*
- Developed a Finite Volume solver (in MATLAB) to numerically solve the generation of acoustic waves in a piston cylinder arrangement.

Stability Analysis of the Drag Skirt for the Aeroshell for Mars Exploration Rover *Aug – Dec 2015*
- Derived the equations that gives a measure of the stability of the drag skirt
- Implemented a visualization applet in MATLAB to show the variation of stability with angular disturbance

Simulation of Recirculating flows over a planar sudden expansion *Nov – Dec 2015*
- Implemented a simulation of turbulent flow in FLUENT for a range of Reynolds numbers and flow geometries
- Used the journaling feature in FLUENT to automate parametric analysis

Structural Finite Element Solver *Apr– May 2015*
- Implemented an axisymmetric linearly elastic structural finite element solver in MATLAB

Analysis and Design of Airfoil *Nov – Dec 2014*
- Used PROFOIL to design an airfoil with an objective to minimize drag constrained by geometry
- Used XFOIL to analyze the generated geometry to find the drag on the airfoil

Insect Flight Analysis and Design of Flapping Wing Micro Air Vehicle *Aug 2011 – May 2012*
- Designed and built a scaled mechanized experimental model of fruit fly wings
- Performed CFD analysis of flapping wing flight on FLUENT to obtain aerodynamic forces on the wings

Professional Experience

Mechanical Maintenance Engineer, Reliance Industries Limited**,** Gujrat, India *Jul 2012 – Dec 2013*
- Managed the daily planning and scheduling of maintenance activities in a petrochemical plant
- Improved the workflow of the mechanical department significantly by streamlining the daily tasks
- Supervised 14 technicians
- Oversaw and verified the installation of various mechanical equipment during the building of petrochemical plant

Relevant Courses

Numerical Fluid Dynamics	Computational Aerodynamics	Advanced Gas Dynamics
Finite Element Method	Viscous Flow & Heat Transfer	Applied Aerodynamics
Control Systems Engineering	Aeroelasticity	Discrete Event System Simulation
Mechanics of Materials	Dynamics of Machinery	Machine Design

Leadership Experience

Tutor Coordinator & Tutor, Office of Minority Student Affairs, UIUC *Oct 2014 – May 2016*
- Assisted in hiring, training, supervising and evaluating tutors
- Tutored minority students who needed help in physics

Volunteer Teacher, NIT Calicut, India *Aug 2010 – Apr 2012*
- Volunteered to teach high school students as part of a program by the Govt. of Kerala, India