

ANAND VIJAYKUMAR E.I.T

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OBJECTIVE: Seeking Full-time opportunities in the field of Mechanical Engineering

SUMMARY:

Instrumentation and setup of Multi-Phase pump, Numerical Simulation of the flow field in Labyrinth and Annular Seals, Geometry, Meshing and Visualization framework creation, Pre-processor development for structured mesh generation, Aerodynamic design of Centrifugal Compressor, Stress measurements in a specimen using photoelasticity and digital image processing, Design of fixture and fabrication of 'Swivel Bench Vise'

EDUCATION and TRAINING:

M.S in Mechanical Engineering, **Texas A & M University, College Station** GPR: 3.77 Graduation Dec 2010
B.S in Mechanical Engineering, **Vellore Institute of Technology, India** GPR: 3.58,8.8/10 Graduation May 2007

Completed a 3 day CD-adapco certified training in STAR-CCM+ at CD-adapco, Houston, TX

- Import of Database, setting up Boundary Conditions, Mesh generation, Analysis setup, Post Processing
- Surface diagnostics and fixing, Moving Reference Frames approach, creation of streamline plots and animation
- Tutorials on exhaust manifold, lock valve, conjugate heat transfer problem, Onera wing and ducted fan

PROFESSIONAL EXPERIENCE:

Researcher, Texas A&M University, Advisor: Dr. Gerald L. Morrison Sept '10-present
Turbo-Machinery Laboratory, Texas A&M, College Station,

- Instrumentation and Setup of a Multi-Phase pump

Graduate Research Assistant, Texas A&M University, Advisor: Dr. Gerald L. Morrison Dec '08-May '10
GAR, Turbo-Machinery Laboratory, Texas A&M, College Station,

- Numerical Simulation of the flow field in a Whirling Smooth Annular Seal for non-circular whirl orbits using ANSYS 12
- 3D Hexahedral Mesh generated with Cooper/Map mesh scheme in Gambit 2.4.6 with approx one million nodes
 - Simulations were performed using Fluent's Dynamic Mesh Model and hooked up with UDF's for rotor motion
 - The transient problem was rendered quasi-steady by suitable transformations to rotating frame using Fluent's Moving Reference Frame Model
 - The computed velocity and pressure fields compared with LDA measurements on annular and labyrinth seals at Turbomachinery Laboratory at Texas A&M University
 - Post processing with exaggeration of clearance done using Tecplot 360 and higher order polynomial fit using TableCurve 2D
 - Submitted jobs scripts for running Fluent on Supercomputer Hydra (IBM Cluster 1600)

Numerical Simulation of flow field in Labyrinth Seals

- 2D Quadrilateral Mesh generated using Gambit 2.4.6 with approx quarter million nodes
- Simulations performed in ANSYS 12 to plot the carry over coefficient and discharge coefficient
- The computed velocity field compared with LDA measurements on labyrinth seals at Turbomachinery Laboratory at Texas A&M University

Edibon International, S.A, Spain

June '10 -Aug '10

Engineering Intern, Technical

- Stress analysis in a specimen using photoelasticity and digital image processing techniques using Matlab image processing toolbox
- Experimental determination of pipe friction loss and head loss coefficients in pipes
- Gear tooth simulation using ANSYS Workbench 12

Honeywell Technology Solutions Inc, Bangalore, India

Sept '07 -July '08

Engineer, Mechanical Center of Excellence (MCOE)

- Developed a Geometry, Meshing and Visualization framework for Computer Aided Engineering applications
- Worked on a 3D structured Mesh Generator using QT (Trolltech) and OpenCascades (Graphics) for importing, meshing and modifying geometry of airfoil blade sections. The application could import IGES and STEP file formats
- Automated system for online documentation of code and comments using Doxygen
- Successfully built Gmsh (open source meshing library) on windows platform using eclipse IDE

Honeywell Technology Solutions Inc, Bangalore, India

Dec '06-May '07

Intern, Rotating Turbo Machinery, Bangalore, India

- Project on design methodology for Aerodynamic Design of Centrifugal Compressors for Micro-Jet Gas Turbine Engine. The design methodology was further verified by performing a CFD simulation using ANSYS CFX
- Inverse mean line design of the Centrifugal Compressor using Minitab

Trainee, Ador Welding Ltd, Mumbai, India

May '05–June '05

- Carried out a Project on 'Process Optimization of a wire cutting machine' using principles of Time Study and Work Study

Trainee, Siemens India Ltd, Kalwa Works, India

Dec '05

- Mini Project on 'Design of a fixture for a gearbox assembly' at Switch Gear section, Siemens

Web Designer, Molecular Cytogenetics Lab, Texas A&M University College Station

- Created a Web page for the Molecular Cytogenetics Lab and wrote excel macros (VBA) July '08-Dec '08

RELATED COURSE WORK:

Engineering Mathematics, Fluid Mechanics, Intermediate Heat Transfer, Advanced Computational Methods in Fluid Flow, Two Phase Flows, Gas Dynamics, Computational Fluid Dynamics, HVAC, Alternative Energy Conversion, Introduction to Finite Element Methods, Turbulence Measurements

ACADEMIC PROJECTS:

- **Turbulence Measurements:** experimental study of free jet characteristics and flow visualization from radially lobed nozzles
- **Alternative Energy Conversion:**
 1. Design of active solar heating system located at 42° North Latitude
 2. Photovoltaic System Design study for single family located at College Station, Texas
 3. Case studies on passive solar for quantitative information regarding energy savings
- **Conduction in Composite Pipe:** Finite Element Analysis of heat conduction through a composite pipe
- **Literature Review:** Literature Review and detailed study on Flow Boiling in Microchannels
- **Modeling and Analysis of a Centrifugal Pump:** Centrifugal Pump Model was created in SolidWorks and CFD simulations were performed in Fluent for Performance analysis
- **Swivel Bench Vise:** Fabricated a 'Swivel Bench Vise' and performed Stress analysis and animation using Cosmos Express (SolidWorks)
- **Renewable Energy Model:** developed a renewable energy model for generating electricity from fruit waste (Electrolytic Cells coupled with Light Intensity Controller) and exhibited the working of Hydrogen Fuel Cells.

TECHNICAL SKILLS:

Languages : C, C++, Qt (Trolltech), Java, HTML.

Operating Systems : Linux, Windows, Mac OS X, Hydra (IBM Cluster 1600)

Mechanical SolidWorks(Modeling,Assembling, Drafting), PRO-E (2000-i), ANSYS-Workbench 12,

Packages: ANSYS-Blade Modeler, MATLAB, Tecplot 360, Fluent 12, Gambit 2.4.6, excel VBA

HONORS /CERTIFICATION:

- Engineer-In-Training (E.I.T), US-Texas certification June '10
- Six Sigma Green Belt certified by Honeywell Technology Solutions, Bangalore, India Jan '07
- Graduate Fellowship from Mechanical Department at Texas A&M University May '08
- Certificate of Merit for excellence in academics (Scholarship-2004-05), Vellore Institute of Technology
- Received the third prize for paper presentation Titled "*Intelligent Internal Combustion Engines*"

LEADERSHIP SKILLS:

- Led the three member team for Six Sigma Green Belt certification
- Was an active member of organizations like ISTE (Indian Society of Technical Education), SAE (Society of Automotive Engineers) and a member of the Toast Masters Club at Honeywell
- Active member of MEGSO (Mechanical Engineering Graduate Student Organization) at Texas A&M University

CONFERENCE and SYMPOSIUMS:

- Conference paper titled "Numerical Simulation of the flow field in a statically and dynamically eccentric annular seal with non-circular whirl orbits" ASMEFED-ICNMM2010-30839, 2010, Montreal, Canada
- Turbomachinery Research Consortium (TRC) report on "Numerical Simulation of Flow Field in Annular and Labyrinth seals for comparison with experimental LDA data".