Potluri Vachan Deep
Mechanical Engineering Department
Indian Institute of Technology Bombay

Ph.D. research scholar
Male
DOB: 24-01-1997

Examination	University	Institute	Year	CPI/%
Graduation	IIT Bombay	IIT Bombay	2018	9.72
Intermediate/+2	Andhra Pradesh Board of Intermediate Education	Excel Junior College	2014	97.3
Matriculation	Andhra Pradesh Board of Secondary Education	Vardhana School	2012	9.70

PROJECTS

- **High Resolution Schemes for Compressible Flows**   [**December '16 – April '18**]
  Prof. Bhalchandra Puranik | Mechanical Engineering Department, IIT Bombay
  Development of High Resolution Schemes for Compressible Flows within OpenFOAM framework as a part of B.Tech Project

  - Coupled an existing solver *rhoCentralFoam*, which uses Kurganov-Tadmor flux scheme, with **RK3 time integration scheme** by **making new solver** *rhoCentralFoamRK3* and tested it on 1D and 2D test cases
  - Made a new solver *ausmPlusUpFoamRK3*, that uses **AUSM$^+$-up flux scheme** along with RK3 time integration scheme
  - Compared results of *ausmPlusUpFoamRK3* with *rhoCentralFoamRK3* on several 1D and 2D test cases to conclude that on reasonable grids
    * Kurganov-Tadmor scheme fails to capture stationary contact discontinuities
    * AUSM$^+$-up scheme fails in cases involving severe expansion
    * Both schemes fare poorly in cases involving strong slip lines

- **Unified 2D Finite Element**   [**March '18 – April '18**]
  Prof. Parag Tandiya | Mechanical Engineering Department, IIT Bombay
  Implementing a new element within Finite Element Analysis Program (FEAP) framework as a part of Finite Element and Boundary Element Methods course in a team of 5

  - Developed a subroutine in FORTRAN77 for a **new combined Plane Stress, Plain Strain and Axi–symmetric linear elasto–static element**
  - Validated the subroutine using several simple test cases

- **Stair Climbing Wheel Chair**   [**June '17 – December '17**]
  Prof. Shantanu Tripathi | Mechanical Engineering Department, IIT Bombay
  Coming up with effective solution to a chosen social problem in the domain of Mechanical Engineering as a part of Machine Design course croject in a team of 5

  - Proposed a new mechanism for a **passive wheel chair** capable of **climbing stairs** using the force provided by a companion
  - Built a **full scale basic functioning prototype** within 2 months constraining to the alloted budget and resources
  - Tested the prototype on 2 different stair gemoetries and demonstrated it's effectiveness to Mechanical Engineering Department faculty and staff, and other students

- **Rarified Gas Flows**   [**May '16 – June '16**]
  Prof. Amit Agrawal | Mechanical Engineering Department, IIT Bombay
  Verifying simulations of flows in continuum–transition regime with Augmented Burnett equations

  - Written a finite difference based MATLAB code to verify 2D experimental/simulation data with Augmented Burnett equations and validated it with Navier–Stokes solution
  - Tested the code with Monte Carlo type Direct Simulation data of 0.01 Knudsen Number flow and obtained normalized error of order 10%

INTERNSHIPS

- **GE90 HPC Airfoil Durability Analysis**   [**May '17 – July '17**]
  Mr. Nageswara Ganji, Mr. Devesh Ojha | John F. Welch Technology Center, General Electric
  Analyzing effect of material changes and damages on stage–9 rotor blade of High Pressure Compressor of GE90–115B aircraft engine using ANSYS in a team of 2

  - Modified existing **rotor blade mesh to model**
    1. Three types of **damaged blades** by making notches at different locations on the leading edge
    2. A **defected blade** by changing thickness of leading edge according to manufacturing tolerance
  - Simulated vibration response and, **generated Campbell Diagrams** and **recalculated Endurance Limit** at critical location of undamaged, damaged and defected blades for 3 different materials

SCHOLASTIC ACHIEVEMENTS

- Stood 2nd in Department out of more than 150 students in B.Tech.   [**May '18**]
- Scored 829 in **Graduate Aptitude Test in Engineering** (GATE) 2018   [**March '18**]
- Secured All India Rank 129 in **JEE Advanced 2014** in general category   [**May '14**]
- Awarded **Kishore Vigyanik Protshahan Yogana** (KVPY) fellowship by Indian Institute of Science (IISc), Bangalore   [**December '13**]
- Secured position among top 1% students of former Andhra Pradesh who participated in **National Standard Examination in Physics** (NSEP)   [**December '13**]

ELECTIVE COURSES UNDERTAKEN IN B.TECH.

Fundamentals of Gas Dynamics, Convective Heat Transfer, Computational Fluid Dynamics, Numerical Methods for Conservation Laws, Essentials of Turbulence, Fuels and Combustion, Finite Element and Boundary Element methods, Introduction to Thermoacoustics

COURSES UNDERTAKEN DURING PH.D.

Advanced Heat transfer, Fluid Dynamics, Mathematical Models in Engineering, Galerkin Methods for Fluid Dynamics, High Performance Scientific computing, Magnetohydrodynamics and its Engineering Applications, Particle Methods for Fluid Flow Simulation