Arun Ravi Varma

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EDUCATION

M.Phil (standalone) in Mechanical Engineering 2019 - 2021
Newcastle University, Newcastle upon Tyne, UK

Thesis: Physical analysis and modelling of turbulent premixed combustion using Direct Numerical Simulations
Supervisors: Professor Nilanjan Chakraborty, Dr. Umair Ahmed

Master of Technology (M.Tech) in Mechanical Engineering 2010 - 2012
National Institue of Technology, Calicut, India

Specialization: **Thermal Sciences** with emphasis on Computational Fluid Dynamics, IC Engines, Advanced Heat Transfer and Advanced Fluid Mechanics
Thesis: Simulation, Design and Development of a High Frequency Corona Discharge Ignition System
Seminars conducted: Homogenous Charge Compression Ignition Engines, Six stroke engines

Bachelor of Technology (B.Tech) in Mechanical Engineering 2005 - 2009
University of Calicut, Kerala, India

Project: Design, Analysis and Mathematical Simulation of an Evaporative Cooler

TEACHING EXPERIENCE

- As a certified teaching assistant at Newcastle University, I tutored courses in Computational Methodologies, Heat Transfer and Engineering Mathematics. The responsibilities included organization of tutorial sessions to demonstrate the usage of Fluent software, help the students with numerical problems and grading examination papers. I was also involved in preparation of lecture notes for courses in computational methods and heat transfer.

2019 - 2021

- As a teaching assistant for various undergraduate laboratory courses in Mechanical Engineering at NIT Calicut, I was tasked with the demonstration of the experimental procedures, supervision of the experiments carried out by the students and verification of the validity of the results.

2010 - 2012

PROFESSIONAL EXPERIENCE

Lead CAE Analyst 2016 - 2019
Faurecia Emission Control Technologies, Bangalore, India

- Design and development of exhaust systems for OEMs such as Audi, BMW, Porsche, Ford and Volkwagen.Perform design validation of exhaust systems using Heat transfer, Thermo-mechanical, Eigen value and Frequency response simulations. Propose design improvements to optimize performance and durability, based on the simulation results.
- This role involved the responsibilities as a **customer interface**, communicating with the counterparts in Europe and mentoring a team of 3 simulation engineers in execution of projects.

CAE Executive 2012 - 2016
Larsen and Toubro Technology Services (L&T TS), Bangalore, India

- Perform FE simulations for design validation of components used in various industries such as automotive, industrial products and in the medical equipment domain.

RESEARCH

Journal publications:

Arun Ravi Varma, Umair Ahmed and Nilanjan Chakraborty, **"Effects of body forces on turbulent kinetic energy transport in premixed flames"**, Flow Turbulence and Combustion, 2022 - **Accepted for publication**.

Arun Ravi Varma, Umair Ahmed and Nilanjan Chakraborty, **"Effects of body forces on vorticity and enstrophy evolutions in turbulent premixed flames"**, Physics of Fluids 035102, 2021, doi: 10.1063/5.0037698 - **Featured article**

Arun Ravi Varma, Umair Ahmed and Nilanjan Chakraborty, **"Effects of body forces on the statistics of Flame Surface Density and its evolution in statistically planar turbulent premixed flames"**, Flow Turbulence and Combustion, 2021.
https://doi.org/10.1007/s10494-021-00268-9

Arun Ravi Varma, Umair Ahmed, Markus Klein and Nilanjan Chakraborty, **"Effects of turbulent length scale on the bending effect of turbulent burning velocity in premixed turbulent combustion"**, Combustion and Flame, 2021.
https://doi.org/10.1016/j.combustflame.2021.111569

Varma, A. and Thomas, S., **"Simulation, Design and Development of a High Frequency Corona Discharge Ignition System"**, SAE Technical Paper 2013-26-0014, 2013.
doi: 10.4271/2013-26-0014.

Conference papers:

Arun Ravi Varma, Umair Ahmed and Nilanjan Chakraborty, **"Effects of buoyancy on turbulent kinetic energy transport in turbulent premixed flames"**, The 13th International ERCOFTAC symposium on Engineering, Turbulence, Modelling and Measurements (ETMM), September 2021

Presentations:

Arun Ravi Varma, Umair Ahmed and Nilanjan Chakraborty, **"Investigation of the effects of body forces on flame-turbulence interactions in turbulent premixed combustion"**, UKCTRF - Annual Meeting, March 2021 - **Second prize** in Audio-Visual Category.

SCHOLARSHIPS

All India Council for Technical Education (AICTE) - Postgraduate scholarship
2010 - 2012

SKILLS AND SCORES

Programming : C programming, Matlab, FORTRAN
Software : ANSYS, Fluent, Abaqus, Nastran, OpenFOAM; Microsoft Office, LaTeX
GRE scores : Verbal Reasoning - 158; Quantitative Reasoning - 156; Analytical Writing - 4.0