Tariq Ridwan

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Education

UPC · BARCELONA TECH
PhD in Aerospace Engineering
2021-ongoing Barcelona, ES

IIUM
MSc, BSc Mechanical Engg.
2017-19, 2010-14 Kuala Lumpur, MY

CTH
MSc Applied Mechanics
2014-15 Göteborg, SE

LUH
BSc Research Internship
Jun-Sep 2013 Hannover, DE

Research Grant

DOCTORAL GRANT €98,960
Ministerio de Ciencia e Innovación, España
Fellowship for doctoral research.

Research Interest

· Meteorology, wind energy, fuels.
· ABL, land-atmosphere interaction.
· Turbulent mixing, buoyancy- and shear-driven flows, entrainment.
· Development of HPC multi-physics CFD codes for supercomputers.
· LES, DNS, HPC.

Coursework

PhD
Atmospheric Physics
Finite Elements in Fluids

Masters
Mechanics of Fluids
CFD of Turbulent Flow
Compressible Flow
Gas Turbine Technology
Thesis: A comparative study of natural gas & biogas combustion in swirling flow gas turbine combustor

Skills

Programming
Fortran • Python • MATLAB • C/C++

Miscellaneous
Git • Shell • LaTeX

Honors

Swedish Institute scholarship
for MSc Applied Mechanics studies.

IIUM Excellence Award
Awarded to top 5 students of the university, for BSc studies.

Experience

DOCTORAL RESEARCHER
Barcelona Supercomputing Center
Dec 2021 – Present Barcelona, Spain

- Modeling properties of large turbulent coherent structures in the atmospheric boundary layer (ABL) to improve the characterization of wind properties for wind-energy applications.
- Development of HPC multi-physics CFD code *Alya* to simulate the turbulent ABL flows in *Marenostrum 5* supercomputer at BSC.

R&D ENGINEER
Vortex Engineering Enterprise
Jan 2021 - Nov 2021 Kuala Lumpur, Malaysia

- Multidisciplinary numerical simulations and modelling, Alternate Fuels combustion, Gas Turbine Engine design.

RESEARCH ASSOCIATE
Jubail University College
Jun 2020 - Nov 2021 Jubail, Saudi Arabia *(remote work)*

- Mechanical design & development of an alternate fuel powered engine components, combustion CFD simulations.

CFD CONSULTANT
Jubail University College
Aug 2018 - Feb 2019 Jubail, Saudi Arabia *(remote work)*

- Provided CFD solutions for Fluid-Structure Interaction simulations.

RESEARCH INTERN
Institut für Turbomaschinen und Fluid-Dynamik, LUH
Jun 2013 - Sep 2013 Hannover, Germany

- Worked on LES of the secondary flow in diffusers of stationary gas turbines using OpenFOAM in the institute's HPC system.

RESEARCH ASSISTANT
IIUM
Feb 2012 - Jul 2014 Kuala Lumpur, Malaysia

- Developed codes for highly non-linear PDEs using FDM and Fornberg's algorithm to simulate nano-thin film flows.

Recent Projects

TABL4CW
Universitat Politècnica de Catalunya · Barcelona Tech
Dec 2021 – Feb 2024 Barcelona, ES

- *Turbulence and large coherent structures in the atmospheric boundary layer: Fundamental aspects for parametrizations of cloud formation and for wind-energy applications*. URL: futur.upc.edu. Fund: €96,800.
- The project exploits multidisciplinary expertise of 15 researchers around EU and their international collaborations. Together, they bring expertise in turbulence and meteorology, wind energy, fluid mechanics and stability analysis, numerical simulation and HPC.

Publications

- "A comparative study of Natural Gas and Biogas combustion in a swirling flow gas turbine combustor". Combustion Science & Technology, 1-28. DOI: 10.1080/00102202.2021.1882441
- "An investigation of RANS simulations for swirl-stabilized isothermal turbulent flow in a gas turbine burner". CFD Letters 11 (9), 14-31. URL