

# 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 · CHALMERS

MSC APPLIED MECHANICS

2014-15 Göteborg, SE

### LUH · LU HANNOVER

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 · UPC

Dec 2021 – Present Barcelona, ES

- 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, MY

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

### RESEARCH ASSOCIATE

JUBAIL UNIVERSITY COLLEGE

Jun 2020 – Nov 2021 Jubail, SA (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, SA (remote work)

- Provided CFD solutions for Fluid-Structure Interaction simulations.

### RESEARCH INTERN

INSTITUT FÜR TURBOMASCHINEN UND FLUID-DYNAMIK, LUH

Jun 2013 – Sep 2013 Hannover, DE

- 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, MY

- 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