AHMED H. HANFY

Mechanical Engineer ||
Aerodynamic specialist

PROFILE

Doctoral researcher in the Marie Curie fellowship program with expertise in experimental aerodynamics. Proficient in Python, MATLAB, and C++; skilled in data/image analysis. Proficient in CAD modeling using Autodesk Inventor and adept with Siemens NX. Seeking to contribute expertise, pursue learning, and advance career.

CONTACT ME

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LANGUAGES

English ★★★★

Italian ★★

Polish ★

Arabic ★★★★★

SKILLS

Ansys (Fluent)
Inventor
Siemens NX
Python
MATLAB
LabVIEW

OTHER SKILLS

Wind-tunnel operation |Test planning | Research | Manufacturing | 3D printing | Technical drawings| C++ | Fortran | OpenMPI | MATLAB GUI | PCA | Analysis | Machine learning | Image analysis | Signal processing | OOP | MS Office.

ACTIVITIES

Summer trainings [Hydro-electric stations, Diesel engines & Hydraulic maintains (MANTRAC), ASME CFD workshop].
Volunteering [researcher's night, Science Club Chairman, Torpedo robotics team: Participate in the MATE ROV competitions to perform underwater tasks].

EXPERIENCE

Doctoral Researcher (Aerodynamic specialist) [11/2020 - Present]

Institute of fluid-flow machinery polish academy of sciences, Gdansk (Poland)

Full-time employment at IMP PAN transonic wind tunnel as an experimental aerodynamics specialist, played a key role in various projects:

- **SMS Project (Vibrating trailing edge of a morphing supercritical airfoil)**
  - Conducted a POD analysis on PIV data for the Airbus A320 aerofoil in the transonic regime, effectively eliminating noise from the velocity dataset.
  - Executed precise analysis of velocity fluctuations in the wake.
- **TEAMAero Project (SBLI on compressor rotor profile with flow control)**
  - Led test planning for experimental investigations into the effects of manufacturing and roughness on the transonic compressor fan profile.
  - Coordinated collaboration with project partner Rolls Royce Deutschland.
  - Modified the design and provided detailed drawings for an existing single-passage compressor fan profile.
  - Operated a blowdown wind tunnel.
  - Implemented various measurement techniques to capture aerodynamic performance accurately.
  - Engineered a 30% increase in suction efficiency by modeling the piping system to control corner flows.
  - Enhanced the wind tunnel feedback system and fast camera triggering using LabVIEW and DAQ devices, achieving a remarkable accuracy of 0.6ms.
  - Developed Python tools and packages for image/signal processing, test data, and analysis, significantly enhancing understanding of flow physics.

SCIENTIFIC VISITS AND INTERNSHIPS

Visiting Researcher [08/2022 - 09/2022]

German Aerospace Centre (DLR), Cologne (Germany)

Within Marie Skłodowska-Curie Actions, a scientific secondment was made to DLR Transonic Cascade Wind Tunnel, successfully executed unsteady measurements, including:

- Calibration of Kulite probe and vibration sensors.
- Application analysis on high Data Acquisition rates.
- Synchronization of the speed Schlieren.

Research Internship [02/2020 - 05/2020]

Institute of fluid-flow machinery polish academy of sciences, Gdansk (Poland)

As a complementary course during master's, accomplished the following objectives:

- Proficiently extracted quantitative information from interferograms for experimental study relevant to SWBLI.
- Developed a MATLAB GUI involving FFT and phase shifting.
- Improved phase detection accuracy through the application of machine learning techniques, including DBSCAN, Linear regression, etc.

EDUCATION

Ph.D. Mechanical engineering [11/2020 - Present]

Marie Skłodowska-Curie Actions, Innovative Training Networks HORIZON 2020
Institute of fluid-flow machinery polish academy of sciences, Poland
(Est. Graduation, 2024)

M.Sc. Applied Mathematics and Mathematical Engineering

InterMaths Joint MSc Programme [09/2018 - 05/2020]

- Ivan Franko National University of Lviv (IFNUL), Ukraine [2019 - 2020]
- University of L'Aquila (UAQ), Italy [2018 - 2019]

B.Sc. Mechanical Engineering [09/2011 - 07/2016]

Alexandria University (AU), Egypt

SELECTED PROJECTS

- CFD applications in oil and gas industry (Multiphase, Fluent - BSc. Project)
- Finite Fringe Analysis for Optical Measurement of Compressible Fluid Flow Parameters (MATLAB GUI application - MSc. Thesis)
- Parallel implementation of Poisson's equation (OpenMPI, Fortran and C++)

ACHIEVEMENTS AND AWARDS

MATE ROV 2015, 2016 and 2017 (Torpedo robotics - AU)

- The team achieved 2nd place in the regional competition, ranking 20/600 worldwide.
- The team had international representation at:
  [Long Beach City College, USA (2017),
  NASA Neutral Buoyancy Laboratory, USA (2016),
  and Memorial University of Newfoundland, Canada (2015)].

Full CV