# Robin Joseph

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## Education

**Indian Institute of Science (IISc)** — *Bengaluru*
PhD - Aerospace Engineering — August 2017 - Present

**Indian Institute of Technology (IIT)** — *Guwahati*
M.Tech - Aerodynamics and Propulsion — July 2015 - July 2017

**Indian Institute of Technology (IIT)** — *Patna*
B.Tech - Mechanical Engineering — July 2011 - July 2015

## Experience

**Computational Analysis of Experimental Data** — *Bengaluru*
Research Assistant/ Teaching Assistant — August 2017 - Present

- **Spectral and Statistical analysis** - Developed MATLAB and Python programs for acquisition and analysis of high sampling rate time series data
- **Principal Component Analysis** - Developed MATLAB program to identify dominant features in large image datasets acquired from fluid flow visualizations using vortex detection/two-point correlations/POD analysis
- **Machine Learning** - Identifying turbulent spots (burst detection) in velocity signals (proof of concept) using Mask-RCNN object detection
- **Stability analysis** - Analyzed the dynamics and control of cylinder wake oscillations using an in-house FORTRAN code in a Linux environment

**Wind Tunnel Experiments on Boundary Layer Transition** — *Bengaluru*
Research Assistant/ Teaching Assistant — December 2019 - Present

- Designed and conducted hot-wire and PIV measurements on boundary layer transition
- Measurements led to insights into the mechanism of transition and devised a novel method for improving aerodynamic efficiency
- Drafted scientific documents for patent application, journals and conferences
- Supervised laboratory sessions, performed demonstrations; prepared and graded assignments/quizzes

## Technical Skills

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|---|---|
| **Programming Languages** | MATLAB, Python, SQL (in decreasing order of competence) |
| **Data Analysis** | Statistics, Principal Component Analysis, Time-Frequency Analysis, LaTeX, Numerical Simulations |
| **Behavioural skills** | **Strong capacity for adaptation** - Switching between computational and experimental work<br>**Communication** - Collaborating with scientists/legal experts and presenting work at conferences |
| **Other Interests** | Closely follow global financial markets, applying new analysis techniques to time-series/image data, transforming research output to application/product phase |
| **Experimental Techniques** | Wind-Tunnel Testing, Hot-Wire Anemometry, Particle Image Velocimetry |

## Publications

[1] **Robin Joseph**, Sourabh Suhas Diwan "Growth of Disturbances in a Pre-transitional Boundary Layer Downstream of Distributed Surface Roughness" *Asian Congress of Fluid Mechanics*, 393-402. [Link]

[2] **Robin Joseph**, Sourabh Suhas Diwan, "Effect of Distributed Roughness on Boundary Layer Transition Induced by Free-stream Turbulence" *American Institute of Aeronautics and Astronautics, AVIATION 2022 Forum* [Link]

[3] **Robin Joseph**, P.Phani Kumar, Sourabh Suhas Diwan, "Characterization of streak development for boundary layer transition caused by isolated and distributed roughness" *Experiments in Fluids (Submitted)* [Link]

[4] **Robin Joseph**, P.Phani Kumar, Sourabh Suhas Diwan, " Aerofoil Bodies for Delaying Roughness-Induced Transition of Laminar Flow of Fluids into Turbulent Flow" ***Patent Pending***

[5] **Robin Joseph**, P.Phani Kumar, Sourabh Suhas Diwan, "Wind tunnel experiments on boundary layer transition caused by coarse distributed roughness" ***Poster presentation, 2nd Place***, *American Society of Mechanical Engineering, GT India conference* [Link]