

# JOHN SEBASTIAN

2johnsebastian@gmail.com ◇ john-seb.github.io

## Research Interests

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*Applied Mathematics; Fluid Mechanics; Experimental Development; Engineering for Biology*

## Education

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**College of Engineering, Trivandrum**

**University of Kerala**

*July 2013 - May 2017*

Bachelor of Technology (Mechanical Engineering)

*First Class with Distinction*

## Professional Research Experience

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**Research & Development, MRF Tyres**

*July 2017 - September 2020*

*Research Engineer*

*Chennai, India*

- Designed novel experiments to derive the dynamic characteristic curves of motorcycle tyres by constraining relative slip
- Implemented a statistical tyre performance prediction method to reduce the number of track tests
- Developed image analysis methods to estimate complex deformations at the tyre contact patch and established its effect on higher harmonic vibrations
- Devised a numerical method for optimising the geometry of cross ply motorcycle tyres using Class Shape Transformation (CST) parameterisation translated from airfoil theory

**STAD TechnoInnovations**

*October 2015 - April 2016*

*Mechanical Design Intern*

*Ernakulam, India*

- Reverse engineered the complex shape and material characteristics of the tibial bone implant
- Designed a fully enclosed knee retraction mechanism for patients with ACL damage

## Academic Research Projects

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**Design and Optimization of Short Span Hydrofoils**

*Bachelor's Thesis*

*Supervisor: Dr Ranjith S Kumar*

- Developed a general inverse design method for foil sections with improved prescription of structural properties
- Proposed a simple method to integrate the effect of the free surface on hydrofoil lift

**Rapid and Low- Cost Fabrication of Microfluidic Chips**

*Supervisor: Dr Ranjith S Kumar*

*Micro/nanofluidics Research Laboratory*

- Developed a rapid prototyping method to make simple, expendable microfluidic lab-on-a-chip panels on plastic (sandwiched and layered), with fluid channels as small as 150 microns

## Leadership and Mentorship Roles

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**Member, Emergency Design Collective (EDC)**

*2020*

- Part of a global team of problem solvers working together to mitigate new challenges in the wake of the COVID-19 pandemic.
- Nominated to top three projects under "Educational Challenges during a Pandemic"

**Student Coordinator, Innovation Center CET**

*2016 - 17*

- Coordinated weekly meetings, brainstorming sessions and training programs in the state run facility
- Organised the first undergraduate thesis project expo, Innov-EXPO in May 2017

**Bosch Student Ambassador**

2016 - 17

- Coordinated research collaboration, projects and student placements

**Project Coordinator, Society of Automotive Engineers (SAE)**

2015 - 16

- Launched and mentored eight projects and maximized student participation in national design competitions

**Selected Achievements**

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- Institute Topper - IET PATW 2016 Presentation Competition “*Microfluidics for the Future*”  
*Institution of Engineering and Technology (IET)- Present Around The World (PATW)*
- Founded CETALKS, an in- campus talk show in 2015
- Attended Indian Science Congress 2010 as Student Delegate

**Additional Courses (Relevant)**

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- BIOE 271 Frugal Science: Project- Detecting Microplastics using Impedance Spectroscopy *Stanford*
- Advanced MATLAB for Scientific Computing *Stanford Lagunita*
- Statistical Learning *Stanford, Lagunita*
- Computer Science 101 *Stanford, Lagunita*
- Data Science Math Skills *Duke, Coursera*
- Basics of Transport Phenomena *TU Delft, Edx*
- Mechanics Review (8.MReVx) *MIT, Edx*

**Extra Curricular Engagement**

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- Selected as travel photographer for a Swiss documentary project, “Yuujuu” into the final team of five, out of 30,000 global applicants in 2019
- Toy making, DIY Microscopy, Origami
- Blogging ([www.storygrapher.org](http://www.storygrapher.org))

**References**

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**Ranjith S. Kumar, PhD**

Assistant Professor  
Micro/nanofluidics Research Laboratory  
Department of Mechanical Engineering  
College of Engineering, Trivandrum  
Kerala, India - 695 016  
Email: [ranjith@cet.ac.in](mailto:ranjith@cet.ac.in)

**Abhilash Suryan, PhD**

LM AIAA, LM AeSI, LM ISTE  
Assistant Professor  
Department of Mechanical Engineering  
College of Engineering, Trivandrum  
Kerala, India - 695 016  
Email: [suryan@cet.ac.in](mailto:suryan@cet.ac.in)

**Sagar Vasant Telrandhe, PhD**

Assistant Manager  
MRF Research Center, MRF Ltd  
Chennai, India - 600 019  
Email: [sagar.telrandhe@mrffmail.com](mailto:sagar.telrandhe@mrffmail.com)

**A. Sreekumaran Nair, PhD**

Senior Manager  
MRF Research Center, MRF Ltd  
Chennai, India - 600 019  
Email: [sreekumaran.nair@mrffmail.com](mailto:sreekumaran.nair@mrffmail.com)