

# Prashant Chandra Pujari

Berkeley, CA, USA | [prashant\\_pujari@berkeley.edu](mailto:prashant_pujari@berkeley.edu) | [LinkedIn](#) | [Google Scholar](#)

## EDUCATION

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**MSc, Engineering Fluid Mechanics for Offshore, Coastal and Built Environments** 2021-2022  
**Imperial College London, United Kingdom**

- Achieved distinction with a GPA of 4.0.
- MSc research project on “Experimental investigation of wave statistics over sloping bathymetry.” (Advisor: Dr. Ioannis Karpadakis)

**B.Tech., Mechanical Engineering, Delhi Technological University, India** 2017-2021

- Achieved distinction with a GPA of 9.61/10.
- Final year research thesis on “Optimizing the performance of Savonius turbine by the application of reorienting blade mechanism.” (Advisor: Dr. Naveen Kumar)

## RESEARCH AND TEACHING EXPERIENCE

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**Research Assistant** 2022-Present  
**Theoretical & Applied Fluid Dynamics Laboratory, University of California, Berkeley, USA**

(Supervisor: Prof. M. Reza Alam)

- Carrying out research in Fluid Mechanics and Ocean Engineering.
- Current projects include energy generation in autonomous sea robots using solar and hydropower; and lensing of wave energy for WECs or coastal protection using the HOS method.

**Teaching Assistant** 2023-Present  
**University of California, Berkeley, USA**

- Engineering Mechanics II ([MECENG 104](#)) - Instructor: Prof. Kenneth N. Kamrin, Fall 2024.
- Thermodynamics ([MECENG 40](#)) - Instructor: Prof. David B. Rich, Summer 2024.
- Fluid Mechanics ([MECENG 106](#)) - Instructor: Prof. M. Reza Alam, Spring 2024.
- Introduction to Computer Programming for Scientists and Engineers ([ENGIN 7](#)) - Instructor: Prof. M. Reza Alam, Spring 2023.

**Undergraduate Research Assistant** 2017-2021  
**Centre for Advanced Studies and Research in Automotive Engineering, Delhi Technological University**

(Supervisor: Dr. Naveen Kumar)

- Conducted various individual and group research projects in renewable energy, fluid mechanics, and computational fluid dynamics.
- Mentored freshman and sophomore students to initiate research in mechanical sciences.

## RESEARCH PROJECTS

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**Broadband Wall-less Waveguide for Shallow Water Waves (UC Berkeley)** 2023-Present

- Developed a pioneering approach to control wave propagation over long distances without physical boundaries.
- Inspired by graded-index optical fibers, utilized a visco-elastic sea-bed carpet to modulate gravitational effects.
- Conducted numerical simulations demonstrating superior wave confinement with minimal energy loss, offering promising solutions for artificial surf zones, wave energy farms, and coastal protection systems.

**The Underwater Brachistochrone (UC Berkeley)** 2023

- Investigated optimal underwater trajectories for efficient projectile movement between two points.
- Addressed limitations of traditional cycloidal paths, considering various factors including gravity and hydrodynamic forces (viscosity, buoyancy, and added mass).
- Identified applications as a planning tool for short-range trajectories of underwater gliders, contributing to efficient marine navigation strategies.

- Real-time Ocean Prediction via a Grid of Autonomous Swarm Ocean Sensors** (*UC Berkeley*) 2022-2023
- Devised a cost-effective solution for predicting real-time ocean waves, targeting the significant fuel wastage prevalent in maritime transportation.
  - Developed a swarm of autonomous, self-powered smart ocean sensors, coupled with data-driven prediction algorithms, to forecast ocean waves in real-time.
  - Each ocean sensor unit is capable of autonomous positioning, enabling precise wave measurement and facilitating smart and efficient seaway navigation, anticipated to yield a 15% reduction in operational costs.
- Experimental Investigation of Wave Statistics over Sloping Bathymetry** (*Imperial*) 2022
- Conducted experiments in a coastal flume with a bed slope of 1:50 to study the evolution of key wave parameters in varying sea states.
  - Observed the effects of non-linear amplification and wave breaking on significant wave height and mean water level, discerning their variations under different sea-state conditions.
  - Investigated the short-term statistical distribution of wave heights and crest heights, comparing findings with established theoretical models to validate experimental results.
- Vortex-Induced Vibration Assessment** (*Imperial-Ramboll*) 2022
- Analyzed structural integrity of jacket platforms in shallow waters near the UK under given environmental conditions.
  - Studied wind, waves, and ocean currents, calculating drag, inertial loads, and natural frequencies for each structural member.
  - Employed DNVGL's standard design codes for vortex-induced vibration assessments, identifying optimization strategies for failing components and proposing preventive measures for enhanced structural integrity.
- Active Winglets Aerodynamics of a SuperSport Motorcycle** (*DTU*) 2021
- Investigated the aerodynamic effects of active winglets on a SuperSport motorcycle.
  - Utilized SolidWorks for solid modeling of the motorcycle with a rider, conducting CFD analysis to quantify drag and lift coefficients for two winglet configurations.
  - Demonstrated a 13.8% increase in downforce for improved cornering stability with the first winglet setup, while achieving an 8.27% reduction in drag force for enhanced acceleration with the second configuration.
- Solar Powered Multi-Utility Vehicle** (*DTU*) 2019
- Led a team to develop DTU's first solar-powered vehicle, integrating solar panels onto the chassis.
  - Orchestrated the design and manufacturing phases, meticulously integrating four 150W solar panels, a motor controller, and a charge controller into the vehicle's framework.
  - Engineered the multi-utility vehicle to accommodate a maximum load of 400 Kg while maintaining a consistent speed of 25 km/h, facilitating its regular usage within the university's research laboratory.

## **PUBLICATIONS**

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- Prashant Chandra Pujari, Aneesh Jois, Jacob Lim, Stephanie Popielarz, Jianxi Wang, Mohammad-Reza Alam, 2024, [\*Real-Time Ocean Prediction via a Grid of Autonomous Self-powered Swarm of Ocean Sensors\*](#). Integrated Systems: Data Driven Engineering, Springer.
- Prashant Chandra Pujari, Devang S. Nath, Amit Jain, Naveen Kumar, 2021, [\*Performance Enhancement of Savonius Turbine with the Application of Reorienting Blade Mechanism\*](#). Energy Sources, Part A: Recovery, Utilization, and Environmental Effects, Taylor & Francis.
- Devang S. Nath, Prashant Chandra Pujari, Amit Jain, Naveen Kumar, 2021, [\*Drag Reduction by Application of Aerodynamic Devices in a Race Car\*](#). Advances in Aerodynamics, Springer.
- Prashant Chandra Pujari, Amit Jain, Devang S Nath, Naveen Kumar, 2021, [\*Designing, modeling, and structural analysis of a newly designed double lobe camshaft for a two-stroke compressed air engine\*](#). Materials Today: Proceedings.
- Vishal Yadav, Prashant Chandra Pujari, Naveen Kumar, 2020, [\*Modification of 4-Stroke SI Engine to a Compressed Air Engine for a Light Utility Vehicle\*](#). IOP Conference Series: Materials Science and Engineering.
- Mukul Tomar, Amit Jain, Prashant Chandra Pujari, Hansham Dewal, Naveen Kumar, 2020, [\*Potentials of Waste Plastic Pyrolysis Oil as an Extender Fuel for Diesel Engine\*](#). Arabian Journal of Geosciences, Springer.

## INTERNATIONAL CONFERENCES

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- Presented a research talk on “[\*A Wall-less Waveguide Solution for Enhanced Propagation of Shallow Water Waves\*](#)” at the **APS March Meeting 2024**.
- Presented a research talk on “[\*The Underwater Brachistochrone\*](#)” at the **APS 76th Annual Meeting of the Division of Fluid Dynamics, 2023**.
- Presented a research talk on “[\*Active Winglets Aerodynamics of a Supersport Motorcycle\*](#)” at the **KSME Annual Meeting 2023**.

## TECHNICAL SKILLS

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- **Programming Language:** C, Python, MATLAB, Julia
- **Software:** SolidWorks, Autodesk Fusion 360, Ansys (Structural & Fluent), OpenFOAM, FEM

## ACHIEVEMENTS

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- **Fellowship** by the Mechanical Engineering Department, UC Berkeley for Summer 2023.
- Recipient of **Departmental Scholarship** and **Equinor Fluid Mechanics Scholarship** at Imperial College London.
- **Department Rank 2** in Mechanical Engineering with an overall CGPA of 9.61/10, class of 2021.
- **Research Excellence Award** for publication of research article titled “Potentials of Waste Plastic Pyrolysis Oil as an Extender Fuel for Diesel Engine,” 2021.
- **International Olympiad of Metropolises, Moscow, Russia:** secured 1st, 21st, and 34th rank in three different competitions in Physics, 2016.

## LEADERSHIP AND VOLUNTEER EXPERIENCE

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- **Mentor** at Oakland Serves: Provided weekly academic support to high school students, focusing on those struggling with coursework or seeking to recover lost credits. 2023-2024
- **Outreach STEM Leader** at Imperial: Led a team of ambassadors in organizing and facilitating activities for young students, fostering their interest and participation in STEM. 2021-2022
- **Volunteer Tutor** at The Access Project: Offered personalized tutoring in A-level mathematics and physics to disadvantaged students, aiding their journey to prestigious UK universities. 2021-2022
- **Youth for Education Mentor:** Guided government school seniors through career exploration and exam preparation, empowering them to pursue their educational goals. 2021
- **President** of IMechE DTU Chapter: Spearheaded a 100+ member strong student organization, overseeing a team of 15 core members to orchestrate quizzes, placement talks, and workshops in collaboration with industry partners. 2020-2021
- **Yoga Trainer** at Elixir, the health society of DTU: Organized weekly yoga camps at DTU to promote physical and mental wellness among students. 2018-2020