

# Narayan Kumar

Graduate Student and Research Assistant - Centre of Applied Coastal Research (CACR)  
Civil, Construction and Environmental Engineering, University of Delaware  
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## Education

### University of Delaware

Newark, DE, USA

#### Ph.D. Civil and Environmental Engineering (Coastal Engineering)

Expected Aug. 2027

- CGPA: **3.5/4.0**
- Specialized courses: Coastal Processes, Ocean Fluid Dynamics, Turbulence & Mixing, Water Wave Mechanics, Ocean Modelling, Water Wave Spectra, Sediment Transport Mechanics, Computing for Coastal Research, Intermediate Engineering Mathematics
- Research Area: CFD simulation of nearshore wave breaking and sediment transport processes. Developing a three-phase and two-phase model for sediment transport SedFoam coupled with Volume of fluid (VOF) type surface wave model to simulate wave-structure interaction and in the future, for swash zone processes.

### Ecole Centrale Nantes

Nantes, France

#### M.Sc. Marine Technology Specialised in Hydrodynamics for Ocean Engineering

June 2022

- Specialized courses: Fluid Mechanics, Marine hydrodynamics, Computational Fluid Dynamics, Continuum Mechanics, Algorithms for Engineering Modelling, Numerical Methods

### National Institute of Technology

Agartala, India

#### Bachelor of Technology Mechanical Engineering

June 2016

- CGPA: **8.85/10.0**
- **Specialised courses:** Fluid dynamics, Hydraulic Machines, Compressible Flow & Jet Propulsion, Thermodynamics, Strength of Materials, Internal Combustion Engines, Heat & Mass Transfer, Machine Design.
- **Centralized pumping System and Rain water harvesting** in NIT Agartala Campus under Prof Dr. Swapan Bhaumik.
- Secured funding for two environmental R&D sponsored projects for Study and investigation of the effect of greenhouse in drying perforated bricks from **Institution Of Engineers**.

## Research Interests

- Sediment Transport Phenomena, Nearshore Wave Breaking, Computational Fluid Dynamics
- Volume of Fluid (VOF) type Surface wave modeling, Wave-Surface interactions, Swash zone processes

## Research Experience

### Civil, Construction and Environmental Engineering, University of Delaware

Newark, DE, USA

#### Graduate Research Assistant

Aug. 2022 - Present

Advisor: **Tian-Jian (Tom) Hsu**

Designed and modeled a Numerical experiment to understand the evolution of solitary wave breaking over a sloping beach.

- Implemented computational fluid dynamics (CFD) based three phase solver (**sedInterFoam**) to evaluate and quantify the sediment transport, morphology and hydrodynamics.

## Honors/Fellowships /Scholarships & Awards

- Selected as **TOS Student Representative for the 2026 Ocean Sciences Meeting by The Oceanography Society (TOS)**, in Dec'24
- Recipient of **American Geophysical Union (AGU) Fall Meeting Student Travel Grant, \$1000** by AGU, in Dec'24
- Recipient of **2024 USCRP Decadal Visioning Workshop Travel Grant, \$1200** by USCRP, in June'24
- Recipient of **The Hydrographic Society of America (THSOA) National Tuition Scholarship, \$1000** by THSOA, in June'24
- Recipient of **Students and New Professionals Travel Scholarship, \$100** to attend the **2024 ASBPA Coastal Summit**, March'24 in Washington D.C., USA.
- Recipient of **Field Inclusive Research Grant (Climate focused), \$500** by **Field Inclusive, Inc.**, in Mar'24

- Selected in **the Spring 2024 VentureOn Program reimbursable fund \$250** by **Venture Development Centre, University of Delaware** , in Mar'24
- Selected as **Community Science Fellow - Thriving Earth Exchange** by **the American Geophysical Union** , in Feb'24
- Recipient of **The Hydrographic Society of America (THSOA) National Tuition Scholarship, \$1000** by **THSOA** , in Dec'23
- Recipient of **Ratcliff Eco Entrepreneurship Fellowship (REEF), \$200** as runner-up Team in **Eco Entrepreneurship Design Sprint 2023** ,Oct'23 at the University of Delaware, USA.
- Awarded **the Nicholas Kraus Coastal Scholar Award , \$600** in **2023 ASBPA National Coastal Conference**, Oct'23 in Providence, Rhode Island, USA.
- Recipient of **Students and New Professionals Travel Scholarship , \$200** to attend the **2023 ASBPA National Coastal Conference** , Oct'23 in Providence, Rhode Island, USA.
- Awarded **Graduate Student Travel Award, \$1000** to attend **the 9th annual YCSEC-A**, Aug'23 in Madison, Wisconsin, USA.
- Selected as recipient of the **WEDA Travel Scholarship, \$1200** for the Dredging Summit & Expo Jul'23, USA.
- Selected as **WEDA Fellow 2023** with a fellowship of **\$12500** by the Western Dredging Association in Feb'23.
- Recipient of **Unlock Education Program Scholarship** of \$1334 (INR 100000) by **SANMAT Foundation** , in Aug'21
- Awarded the **Centrale Nantes Elite Scholarship** for the outstanding international student in Sep'21.
- **Annual Management Recognition** from **Subros Limited** for in-house production Capability Development Plastic Line Set up in 2019.
- Awarded **Research Grants** from **the Institution of Engineers(India), \$750 (INR 50000)** -"Study and investigation of the effect of Greenhouse in drying perforated bricks" and "Study and experimental investigation of utilization of bamboo wastage" in 2015.
- Awarded **a merit certificate of 0.01% student** from **CBSE** for scoring perfect 100/100 in Social Science and 99/100 in Science among **1.1 M students in 2008**.
- First engineering graduate of the economically backward community of Village Panchayat.
- Secured **1st Place** in the Institute-level Technical Quiz competition "Concepto-Mechanics" at NIT Agartala.
- Awarded **3rd Position** in Institute-level Essay Writing competition at NIT Agartala
- Selected for the Regional East and North East India level **IET India Scholarship 2015**.
- Selected for the regional-level science congress in **Jawahar Navodaya Vidyalaya, Hazaribagh (Jharkhand)**, among 25 students.
- Selected for the cluster-level Poem Recitation competition in Jawahar Navodaya Vidyalaya, Latehar (Jharkhand).
- Six Sigma Yellow and White Belt Certified.

## Conference Abstract and Presentation

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- **Narayan Kumar**, Mathieu, Antoine ,Tsai, Benjamin, Hsu, Tianjian , Puleo, Jack and Chauchat, Julien :Cross-shore Beach Profile Evolution Driven by Successive Wave Breaking in Swash Zone. American Geophysical Union (AGU) Fall Meeting, December 2024.
- **Narayan Kumar**, Mathieu, Antoine ,Tsai, Benjamin, Hsu, Tianjian , Puleo, Jack and Chauchat, Julien : Sed-InterFoam: a multi-phase numerical model for sediment transport and its application to swash zones. 38th International Conference on Coastal Engineering (ICCE), September 2024.

- **Narayan Kumar**, Tian-Jian Hsu and Antoine Mathieu : Numerical Modeling Of Two-Dimensional Three Phase Flow Induced By Plunging Solitary Wave On A Sloping Beach. Young Coastal Scientists and Engineers Conference–Americas (YCSEC-A), August 2023.
- **Narayan Kumar**, Tian-Jian Hsu and Antoine Mathieu : Three phase Modeling of flow induced by plunging solitary wave using RANS. ASBPA 2023 National Coastal Conference , October 2023 in Providence, RI.

## Invited Presentation

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- **Narayan Kumar** High Fidelity Numerical Modeling - Coastal Hydrodynamics and Morpho Dynamics. - Western Dredging Association (WEDA) Webinar, October 2023.

## Other Work Experience

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### Subros Limited

Noida, India

#### Senior Engineer: Production Engineering

July 2016 - Sep. 2021

- Managed and led Process Planning & Process Engineering for related functions, Build up technical specification, Selected & evaluated Equipment/Vendor, participated in purchase/Capex process .
- Solved Problem on current potential issues.
- Planned & enhanced capacity to meet present/future requirements.

### Engineering Staff College of India (ESCI)

Hyderabad, India

#### Summer Intern

May 2015 - July 2015

- Developed and implemented methodology to reduced defects of 3D printed Rapid prototyping based on Fused deposition modeling.

### Hindustan Shipyard Limited (HSL)

Visakhapatnam, India

#### Summer Industrial Trainee

June 2014 - July 2014

- Understood various stages involved in manufacturing of Ship including the search for future possibilities that would lead to enhancement in the manufacturing process and outfit engineering.

## Industrial/Academic Projects

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### Project Engineer

Subros Limited, Noida (India)

#### Medical Ventilator production line set up and Quality approval - In COVID 19 crisis

2020

- Modified existing automotive ventilator line .
- Quality assurance and training .

### Project Engineer

Subros Limited, Noida (India)

#### Brazing Line set up - diverting industrial oxygen use to medical use - In COVID 19 Crisis

2020

- Process set up and technology up-gradation to eliminate pure oxygen use in industry .
- Quality assurance and training .
- Formulated Standard operating procedure.

### Project Leader

Subros Limited, Noida (India)

#### Automotive Heat Exchanger - Surface Treatment Process Cycle Time Reduction -Capacity Enhancement

2019 - 21

- Studied Process & Sub Process Cycle Time (CT).
- Proposed Plan with the maker to reduce CT of Subprocess without compensating the Parts Quality.
- MUDA identified, eliminated & Transfer Time reduction between all the tanks
- Reduced Waiting time of Drying oven reduction DNHA-guided Chemical conversation CT reduction and trial , Product Quality validation with change process -Reduced CT 24 Sec to 21.5 Sec

### Project Leader

Subros Limited, Noida (India)

#### Localization of Automotive Heat Exchanger-sub-assembly parts-Denso Japan to Denso

2018 - 20

### Kiloskar India (Bangalore)

- Process Planning & Process Engineering for heat exchanger development.
- Technical Specification build up for Machines, Equipment/Vendor Selection & Evaluation, Request for Quotation, Techno Commercial comparison & participation in purchase /Capex process.
- Problem solving on current potential issues, Capacity Planning & enhancement to meet present/future requirement.
- Achieved Cost Saving of INR 218.8 million.

## Project Leader

Subros Limited, Noida (India)

## Production Capability development for Heating Ventilation and Air Conditioning (HVAC)

2017 - 18

### Plastic Parts

- Process Planning & Process Engineering for plastics parts development
- Set up Injection Moulding Machines
- Resolved potential issues

## Skills

<b>Programmings</b>	MATLAB, Python, C/C++, JAVA, FORTRAN
<b>Softwares</b>	OpenFOAM, Linux, AutoCAD, Solidworks, NX, Star CCM+, Fine-Marine(NUMECA), MS-Office
<b>Languages</b>	English (C2) , French(A1) , Hindi, Japanese
<b>Personal Skills</b>	Critical Thinker, Curious, Self Starter, Adaptable, Flexible, Preserving, Leadership, Communication, Hard-Working
<b>Managements Tools</b>	SAP-PP and MM Module, AQWIMS, PLM

## Training & Workshops

2023	<b>CITI Program</b> , Responsible Conduct of Research (RCR)	University of Delaware
2022	<b>Coursera</b> , Introduction to Programming with <b>MATLAB</b>	Virtual
2022	<b>University of Michigan</b> , Programming for Everybody (Getting Started with) <b>Python</b>	Virtual
2022	<b>freeCodeCamp.org</b> , Statistics for Data Science	Virtual
2022	<b>UC Santa Cruz</b> , <b>C for Everyone</b> : Programming Fundamentals	Virtual
2022	<b>ACADGUILD</b> , Statistics Using Python	Virtual
2022	<b>University College of London</b> , The 3rd <b>UCL OpenFOAM Workshop</b>	Virtual
2021	<b>NUMECA International</b> , CFD Online Course 2021	Virtual
Sep. 5 7, 2014	<b>NIT Agartala</b> , 30th National Convention of chemical Engineers	NIT Agartala
Feb. 5 7, 2016	<b>NIT Agartala</b> , Computational Study on Fluid Transport Phenomena	NIT Agartala

## Position of Responsibility & Extracurricular Activities

### Treasurer

Newark, USA

### Data Science Student Association (DSSA)

Fall 2024

- Fostering a collaborative learning environment, where students can enhance their data analysis skills, engage in hands-on projects, and stay updated with the latest trends in data science and technology

### UD Faculty Senate's Graduate Studies Committee

Newark, USA

### Graduate Student Representative

Fall 2023

- This committee shall review and consider matters relating to graduate education, and shall receive and may stimulate and originate proposals for its development.

### Project Brain Light, University of Delaware

Newark, USA

### Vice President

2022-2023

- Providing interactive experiences and learning opportunities for students in the Delaware area, with an emphasis on populations that are historically underrepresented in the sciences.

### Graduate Student Government, University of Delaware

Newark, USA

### Graduate Student Senator

2022-present

- Advocating and facilitating communication among students, faculty, and administration of UD .

### EmPOWER, College of Engineering, University of Delaware

Newark, USA

### Peer Mentor

2023-present

- Graduate student mentoring and network, where senior and junior students in each department are paired to create a support system for junior students and provide mentoring opportunities for senior students .

### ” WE CAN ” NIT Agartala

Agartala, India

### Educational Change Maker

2012-2016

- Worked and foster the education of underprivileged students

### DEAWRA , University of Delaware

Newark, USA

### Active Member

2022 - Present

- Cleanliness drives

<b>NIT Agartala</b> <b>Event Coordinator</b> <ul style="list-style-type: none"> <li>Robotics event "CONTRAPTION" held in "AAYAM-2014" and "ADAVAITAM-2015"</li> </ul>	<i>Agartala, India</i> 2014-2015
<b>NIT Agartala</b> <b>Student Coordinator</b> <ul style="list-style-type: none"> <li>Workshop "RELIABILITY ENGINEERING AND MANAGEMENT" organized by NIT Agartala and sponsored by TEQIP -II</li> </ul>	<i>Agartala, India</i> 28th Nov- 29th Nov2014
<b>The Institution of Engineers (India)</b> <b>Student Representative</b> <ul style="list-style-type: none"> <li>Conduct multiple IEI's seminars and workshops.</li> </ul>	<i>Agartala, India</i> 2012-2016
<b>Corporate Fitness Freak</b> <b>Half Marathon Runner</b> <ul style="list-style-type: none"> <li>Participated in the 50+ Marathon run.</li> </ul>	<i>New Delhi, India</i> 2017-2021
<b>Rotary Noida Blood Bank&amp; AIIMS Delhi</b> <b>Life Saver &amp; Blood Donor</b> <ul style="list-style-type: none"> <li>Regular Blood Donor &amp; volunteer during Blood Donation Camps.</li> </ul>	<i>New Delhi, India</i> 2017-2021

## Professional Membership

<b>American Geophysical Union (AGU)</b>	Student Member , <b>Since 2024</b>
<b>American Physical Society (APS)</b>	Student Member , <b>Since 2023</b>
<b>American Shore &amp; Beach Preservation Association (ASBPA)</b>	Student Member , <b>Since 2023</b>
<b>American Society of Civil Engineers (ASCE)</b>	Student Member (# 000012310391) , <b>Since 2022</b>
<b>The Hydrographic Society of America (THSOA)</b>	Student Member (# 1520) , <b>Since 2024</b>
<b>Western Dredging Association (WEDA)</b>	Student Member , <b>Since 2023</b>
<b>SUT - US Society for Underwater Technology in the U.S.</b>	Student Member (# 32955) , <b>Since 2023</b>
<b>Institute of Marine Engineering, Science &amp; Technology (IMarEST)</b>	Student Member , <b>Since 2021</b>
<b>International Association of Engineers</b>	Student Member ( #270473) , <b>Since 2020</b>
<b>Society for Industrial and Applied Mathematics (SIAM)</b>	Graduate Student Member (#020996908) , <b>Since 2023</b>