CURRICULUM VITAE (CV) OF Dr. ASHWINI KUMAR OTTA

1. **Name of Expert** : **Dr. ASHWINI KUMAR OTTA**
2. **Date of Birth** : **26.06.1960**
3. **Nationality** : **INDIAN**
4. **Education Qualification** :

College / University	Degrees obtained	Dates of obtainment
College of Engineering / University of Delaware, NE, DE, USA	Ph.D. (Coastal & Ocean Engineering Program)	1992
College of Engineering / University of Delaware, NE, DE, USA	Master's in civil engineering (Coastal & Ocean Engineering Program)	1986
Indian Institute of Technology, Kharagpur	Bachelor of Technology (Hons) (Ocean Engineering & Naval Architecture)	1983

5. **Membership in Professional Societies** :
   - Member, American Geophysical Union (AGU).
6. **Other Trainings** :
   - Project Management, Delft Hydraulics, The Netherlands.
   - Turbulence Modeling, Von Karman Institute of Fluid Mechanics, Brussels, The Netherlands.
7. **Countries of Work Experience** : **USA, The Netherlands, Denmark, UK, India, Papua New Guinea, Singapore, Bangladesh (onsite); Australia, Suriname, Cambodia (offsite)**
8. **Languages** :

Languages	Speaking	Reading	Writing
English	Excellent	Excellent	Excellent
Hindi	Excellent	Excellent	Fair
Dutch	Fair	Fair	Poor

9. **Employment Record**

I. From 2022 to ongoing

Employer : System2C, India

Positions held : Independent Expert & Advisor: Ports, Coasts and Offshore projects., Coastal processes modelling for coastal infrastructure development and blue economy, Climate risk assessment and adaptation.

II. From 2021 to 2022

Employer : Danish Hydraulic Institute, Singapore

Positions held : Principal Coastal Engineer: metocean analysis, coastal processes modelling for coastal infrastructure development and blue economy, climate change risk analysis and adaptation.

III. From 2009 to 2021

Employer : System2C, India

Positions held : Independent Expert, Sustainable solutions for ports, coasts and offshore projects, Marine renewable energy, Climate risk assessment and management for Land Water Interface (LWI).

IV. From 2007 to 2009

Employer : Samundra Institute of Maritime Studies, India

Positions held : R&D Head, Planning and designing R&D infrastructure and R&D projects for both in-house development and externally sponsored projects, Training post-graduate marine engineers.

V. From 2005 to 2007

Employer : Indian Institute of Technology-Kharagpur, India

Positions held : Visiting Faculty, teaching undergraduate and graduate students, research guidance and formulation in coastal and ocean engineering.

VI. From 2001 to 2005

Employer : University of Plymouth, Plymouth, the UK

Positions held : Associate Professor of Coastal Engineering, research guidance and formulation, supervision of doctoral student, teaching undergraduate and graduate students.

VII. From 1998 to 2001

Employer	:	Splash Hydrodynamics, The Netherlands
Positions held	:	Independent Consultant, Model developments, Coastal processes modelling and wave kinematics for complex coastal problems.

VIII. From 1997 - 1998

Employer	:	ICCH, Danish hydraulic institute, Denmark
Positions held	:	R&D Specialist, Development of advanced free surface models, Research on nonlinear processes of wave-current interaction in coastal areas, Research supervision

IX. From 1991 - 1996

Employer	:	Delft Hydraulics (now DeltaRes), The Netherlands
Positions held	:	R&D and Project Engineer, Model development for coastal processes, application of advanced modelling systems for practical solutions, experimental technique and investigation for coastal systems.

X. From 1984 to 1990

Employer	:	University of Delaware, the USA
Positions held	:	Graduate Research and Teaching Assistant, in hydraulics, water resources and coastal engineering.

10. Professional experience:	
Project:	**Inland Water Transport: setting up a framework for sustainable development.**
Year:	2024
Location:	**India**
Client:	Prepared for Forum for River and Ocean Scientists and Technologists (FROST), Bhubaneshwar, India
Positions held:	Individual Contributor
Activities performed: Formulated the parameters for inland water vessels and inland water features necessary for sustainable development**,** including the features for addressing climate change adaptation.	
Project:	**Climate resilience and adaptation options for Hatikamrul-Bonpara & Jhenaidaha Phase-1 Project, Bangladesh. GCA-PR-23-211.**
Year:	2023 - 2024
Location:	**Bangladesh**
Client:	Global Centre on Adaptation (GCA), The Netherlands through AECOM Pvt. (India) Ltd.
Positions held:	Team Leader
Activities performed: Formulation of the overall solution pathways, assessment of climate hazards and vulnerability to flood, precipitation and heat and guide adaptation measures, lead interface between different technical activities and consultants, ensure project quality	
Project:	**Climate Resilient Integrated Southwest Project for Water Resources Management, Bangladesh, Asian Development Bank (ADB) TA-6834.**
Year:	2023 - 2024
Location:	**Bangladesh**
Client:	Asian Development Bank
Positions held:	**Climate Change Specialist** (Engineering and Environmental).
Activities performed: Climate risk and vulnerability analysis of existing Flood Control, Drainage and Irrigation units, Recommend adaptation, Conduct workshop, training and capacity building activities.	
Project:	**Extreme Cyclonic Waves and Coastal Process Modelling for Subarnarekha Port Proj. Ltd, Odisha**
Year:	2023 - 2024
Location:	**India**
Client:	AECOM India Limited
Positions held:	**Technical Advisor** (Engineering and Environmental).
Activities performed: Advised and reviewed hydrodynamic and morphological modelling of the project influence area, Analysed cyclone climate for the project area, Constructed a synthetic super cyclone for determining the extreme waves expected in the project area, Modelled the wave field due to the selected super cyclone, assessed sediment resuspension from dredge disposal site, processed and interpreted the results for engineering design and operations.	
Project:	**Coastal Process Modelling for AM Port on River Mahanadi near Paradeep , Odisha**
Year:	2023
Location:	**India**
Client:	AECOM India Limited
Positions held:	**Technical Advisor** (Engineering and Environmental).
Activities performed: Advised and reviewed hydrodynamic and morphological modelling of the project influence area, assessed	

sediment resuspension from dredge disposal site, reviewed stability of the adjacent shoreline, interpreted the results for engineering design and operations.	
Project:	**Resilient Coastal and Marine Fishery Infrastructure project, Cambodia, Asian Development Bank (ADB) TA-9955.**
Year:	2022
Location:	**Cambodia**
Client:	Asian Development Bank
Positions held:	Technical Advisor and Reviewer
Activities performed: Technical review providing systematic inputs to validate and add objectivity/credibility, rigour and adequacy to the draft report on **"Guidance Note on resilient Coastal and Marine Fishery Infrastructure in Cambodia"**	
Project:	**Climate Change Adaptation Measures at North-West Coast of Singapore.**
Year:	2022
Location:	Singapore
Client:	PUB, National Water Agency of Singapore
Positions held:	Technical Advisor
Activities performed: Guide project and model set-up for coastal processes including hydrodynamic circulation, wind and ship waves and design parameters for climate change adaptation studies.	
Project:	**Site Specific Study and design parameters for climate change adaptation study at MPA Facilities on Offshore Islands to Adapt to Rising Sea Level**
Year:	2022
Location:	Singapore
Client:	Maritime and Port Authority (MPA) of Singapore
Positions held:	Technical Advisor
Activities performed: Guide project formulation and model set-up for wave overtopping and coastal inundation at selected offshore islands and design parameters for climate change adaptation study.	
Project:	**Professional Engineering Services for Climate Change Adaptation Measures at Kranji and Western Catchment Reservoirs of Singapore.**
Year:	2021-2022
Location:	**Singapore**
Client:	PUB, National Water Agency of Singapore
Positions held:	Advisor and Quality Reviewer
Activities performed: Advisor and Quality Reviewer of coastal hydrodynamic and wave modelling and setting parameters for climate change adaptation study.	
Project:	**Met-ocean conditions for design of floating concrete pontoons off Coney Islands for Tiong Seng Contractor Ltd., Singapore.**
Year:	2022
Location:	Singapore
Client:	Tiong Seng Contractor Ltd., Singapore.
Positions held:	Technical Advisor and Reviewer
Activities performed: Technical Advisor and quality reviewer of metocean conditions, extreme Value Analysis of wind, water level and wind waves, characterization and quantification of ship-generated waves at the project site from passing marine traffic.	
Project:	**Thermal Dispersion and Hydraulic Study for Intake System of Keppel Cogen Plant for Jurong Engineering Limited, Singapore.**
Year:	2022
Location:	**Singapore**
Client:	Jurong Engineering Limited, Singapore.
Positions held:	Project Manager & Technical Supervision
Activities performed: Guide project and modelling set-up, coordinate technical interface between field, hydro-thermal modelling and intake system analysis.	
Project:	**Met-ocean and feasibility study for the floating modules for city development at Pasir Ris Singapore.**
Year:	2022
Location:	**Singapore**
Client:	Surbana Jurong Consultants Pte. Ltd., Singapore.
Positions held:	Technical Advisor
Activities performed: Provide technical formulation, guidance and QA/QC of the metocean, hydrodynamic and morphodynamic	

modelling and analysis.	
Project:	**Thermal modelling and Impact Assessment Study for Floating Solar Farm at Jurong Island**
Year:	2021-2022
Location:	**Jurong Island**
Client:	Surbana Jurong Infrastructure Pte. Ltd.
Positions held:	Advisor and Quality Reviewer
Activities performed: Thermal modelling formulation with floating solar panels, tidal simulation with thermal distribution with outfall, intake for power plants and surface heat exchange.	
Project:	**Metocean Data at Pulau Sebarok Jetties, Singapore**
Year:	2021
Location:	**Singapore**
Client:	Paras Marine Solutions Pte. Ltd.
Positions held:	Advisor and Quality control
Activities performed: Metocean analysis of marine parameters including current, waves.	
Project:	**Maharashtra Sustainable Coastal Protection and Management Investment Program (MSCPMIP). ADB TA- 9738 Ind.**
Year:	2020 – 2021
Location:	Mumbai, Maharashtra
Client:	Asian Development Bank (ADB)
Positions held:	Team Leader and Coastal Management Specialist
Activities performed: Led a team of multiple experts and provided technical expertise to prepare project concept note, prepared budget and project milestones and TOR for project consultants for a new phase of Sustainable Coastal Protection and Management Investment projects at several coastal sites of Maharashtra	
Project:	**Project Concept Note on solutions and budget for sustainable coastal protection measures at five different locations in Odisha, ADB TA- 9635 Ind**
Year:	2020
Location:	Odisha, India
Client:	Department of Water Resources, Odisha on behalf of Asian Development Bank (ADB)
Positions held:	Coastal Engineering Expert
Activities performed: Provided conceptual note on solutions and budget for sustainable coastal protection measures at five different locations in Odisha based on field visits, review of previous project reports and site conditions.	
Project:	**Port Enabling Framework Consultants-A, Building Resilience to Climate Change-Package 02, Papua New Guinea , ADB GR-0447**
Year:	2018-2020
Location:	**Papua New Guinea (PNG)**
Client:	Papua New Guinea Port Corporation Limited on behalf of Asian Development Bank (ADB)
Positions held:	Coastal Engineering Expert
Activities performed: Formulated the climate resilience framework for PNG's port projects through assessment of historic records, climate change projections, climate risks and vulnerability.	
Project:	**Construction management US $48 M project and prepared plan and TOR for professional consultants for a project of US $ 93.7 M., for Department of PW, Ports and IWTD of Karnataka under loan agreement with Asian Development Bank, ADB Loan 2679-IND.**
Year:	2015 - 2017
Location:	Karnataka
Client:	Department of PW, Ports and IWTD of Karnataka under loan agreement with Asian Development Bank
Positions held:	Coastal Engineering Expert and Team Leader
Activities performed: Led a team of multiple domain experts, construction management US $48 M project and prepared plan and TOR for professional consultants for a project of US $ 93.7 M.	
PROJECT:	**Monitoring Review of the Mundra Ultra Mega Power Project, Gujarat. ADB SC-105897 Ind, ADB SC-108475 Ind**
Year:	2015, 2016
Location:	Gujarat
Client:	**Asian Development Bank (ADB) – Compliance Review Panel (CRP)**
Positions held:	Marine Environment and Modelling Expert
Activities performed: Reviewed and assessed the performance of the thermal modelling and monitoring of the excess temperature	

due to the hot water discharge from the power plant outfall.	
PROJECT:	**Climate Resilient Coastal Protection and Management, Global Environment Facility (GEF)/Asian Development Bank (ADB) Grant TA-8652 Ind.**
Year:	2015 – 2017
Location:	India
Client:	Govt. of India through FCG ANZDEC Ltd.
Positions held:	Coastal Management Specialist
Activities performed: Climate Change adaptation through structural intervention of the coastline, Climate Risks and Vulnerability Assessment (CRVA) for Karnataka Tranche 2 sub-project sites.	
PROJECT:	**Design of coastal protection schemes at nine sites for Department of PW, Ports and IWTD of Karnataka under loan agreement with Asian Development Bank. ADB Loan 2679- IND**
Year:	2014-2015
Location:	Karnataka
Client:	Department of PW, Ports and IWTD of Karnataka under loan agreement with Asian Development Bank
Positions held:	Coastal Planning and Design Expert
Activities performed: Site-Specific design of coastal protection schemes at nine sites using beach nourishment, offshore reef, T-groynes, groynes, sand-filled geotextile revetment, ecological sand trapping, guided preparation of the bid documents for the corresponding works, amounting to an estimated amount of $65 million.	
PROJECT:	**Compliance Review of the Mundra Ultra Mega Power Project, Gujarat, ADB SC-103659, IND/113495**
Year:	2014
Location:	Gujarat, India
Client:	Asian Development Bank (ADB)- Compliance Review Panel
Positions held:	Marine Environment (Coastal Engineering) Expert
Activities performed: Assessed measurements and modelling of the surface water discharge temperature from discharge by the Coastal Gujarat Power Limited and suggested recommendations to bring the project into compliance.	
PROJECT:	**Design change and construction cost modification of sand-filled geotextile-tube offshore reef at Mirya Bay, Asian Development Bank (ADB) Loan 2679 - IND**
Year:	2014
Location:	Maharashtra, India
Client:	Maharashtra Maritime Board under loan agreement with Asian Development Bank (ADB) through Taylor Engineering INC. (USA) and Mukesh Associates (India) JV.
Positions held:	Coastal Engineering Expert and Deputy Team Leader
Activities performed: Led design change and construction cost modification of sand-filled geotextile-tube offshore reef at Mirya Bay; identification, assessment and prefeasibility studies of shore protection sites; guidance of institutional development and establishing a coastal management information system.	
PROJECT:	**Feasibility study of shifting of a fishing harbour from Vishakhapatnam to Bhimunipatnam for Indian Maritime University.**
Year:	2010
Location:	Vishakhapatnam to Bhimunipatnam
Client:	Indian Maritime University
Positions held:	Technical Advisor
Activities performed: Advised on specifications for Geotechnical and Bathymetric survey, Conceptual layout and estimate preparation, infrastructural arrangement.	
PROJECT:	**Ingression of powder Alumina to a ship's fuel oil tank in the double bottom for ClassNK, Japan.**
Year:	2008 – 2009
Location:	Lonavala, India (offsite)
Client:	ClassNK, Japan
Positions held:	Project Leader
Activities performed: Assessed the main cause, i.e.; vibration-induced motion of powder Alumina, Formulated the project from initiation to completion, Designed experimental setup and guided the investigation.	
PROJECT:	**Design and implementation of a programmable random wave - generation flume for Samundra Institute of Maritime Studies.**
Year:	2007 – 2009
Location:	Lonavala, India
Client:	Samundra Institute of Maritime Studies.
Positions held:	Project Leader

Activities performed: Carried out technical formulation and design of the wave generation and wave flume system; guided construction and installation of the system; training of personnel for using the facility.	
PROJECT:	**New Module 'Port Infrastructure and Management' for post-graduate Diploma course in Indian Institute of Technology.**
Year:	2006-2007
Location:	India
Client:	Indian Institute of Technology
Positions held:	Visiting Faculty
Activities performed: Developed and conducted a new course on 'Port Infrastructure and Management' for the post graduate diploma program.	
PROJECT:	**Summer school on Mathematical Methods in Coastal Engineering**
Year:	2005
Location:	UK
Client:	EPSRC, UK through University of Plymouth
Positions held:	Principal Investigator
Activities performed: Prepared the framework for the advanced training program for a competitive award of the contract by EPSRC, UK. Planned and implemented details of three modules: numerical modelling and analysis, hydrodynamics and Morphodynamics, directed the entire project for the UK and European doctoral students in coastal, hydraulic and water resources engineering.	
PROJECT:	**Supervision of Doctoral Research Work for University of Plymouth, U.K.**
Year:	2002-2006
Location:	United Kingdom (U.K.)
Client:	University of Plymouth, U.K.
Positions held:	Doctoral Advisor
Activities performed: Formulated the research framework, carried out research guidance, quality control and assurance, guided modelling of nearshore hydrodynamics and development of nearshore wave properties for assessment of sediment transport due to nonlinear effects of wave transfer from offshore to nearshore.	
PROJECT:	**Guidance of Doctoral Research Work for University of Plymouth, United Kingdom (U.K.)**
Year:	2002-2004
Location:	United Kingdom (U.K.)
Client:	Engineering and Physical Sciences Research Council (EPSRC), U.K.
Positions held:	Research Advisor
Activities performed: Advised formulating research milestones, methodology, incorporation of physical processes of hydrodynamics and sediment transport and profile change, reviewed progress and quality of work, nearshore nonlinear wave- transformation modelling by Boussinesq-type equation and dynamic combination of bed change response to near-bed hydrodynamic parameters.	
PROJECT:	**Development of design guidelines for low-crested breakwaters for University of Plymouth, U.K.**
Year:	2002-2003
Location:	United Kingdom (U.K.)
Client:	University of Plymouth, U.K.
Positions held:	Associate Professor and Research Guide
Activities performed: As Principal Investigator of the project, developed guidelines for reflection, transmission and overtopping of directional wave spectrum at low-crested breakwaters, interpreted results to support design and analysis of low-crested breakwaters and jetties in ports and coastal infrastructures and implications for existing breakwaters that are likely to be low-crested due to sea level rise under climate change impacts.	
PROJECT:	**Development of an advanced wave model for design and analysis of harbours and coast for Alkyon Hydraulics (NL).**
Year:	2001
Location:	The Netherlands
Client:	Alkyon Hydraulics (NL)
Positions held:	Coastal Modelling Expert
Activities performed: Selected the physical basis for an Advanced Wave Modelling System, formulated the boundary conditions and numerical method, developed a 1D prototype for nonlinear wave propagation in nearshore region.	
PROJECT:	**European Commission, LIP programme, Large-scale experimental investigation of floating breakwaters at UPC, Barcelona.**
Year:	2001
Location:	Barcelona
Client:	European Commission

Positions held:	R&D Consultant
Activities performed: Reviewed and assessed the experimental set-up for investigation of floating breakwaters, Planned the experimental program and data collection.	
PROJECT:	**Field verification & Performance improvement of SWAN (a 4th generation wave propagation model) for Technical University, Delft (NL)**
Year:	2000
Location:	The Netherlands
Client:	Technical University, Delft (NL)
Positions held:	Coastal Wave Modelling Expert
Activities performed: Applied the model to critical field and experimental cases, identified processes for numerical rendition of wave transformation and recommended on the performance of the limiter, used in the numerical model, on the resulting spectral shape.	
PROJECT:	**Suspended sediment concentration at Marsdiep for RIKZ-Dutch Public Works (NL), the Netherlands.**
Year:	2000
Location:	The Netherlands
Client:	RIKZ-Dutch Public Works
Positions held:	Coastal Process Expert
Activities performed: Analyzed the collected sediment and hydrodynamic data; interpreted the data and response at Marsdiep with regards to sediment entrainment & concentration in combination with theoretical prediction as part of ecology & morphology monitoring.	
PROJECT:	**Modeling nonlinear wave transformation through Hamiltonian formulation for RIKZ-Dutch Public Works (NL).**
Year:	1999
Location:	The Netherlands
Client:	RIKZ-Dutch Public Works
Positions held:	Coastal Modelling Expert
Activities performed: Formulated and implemented boundary conditions for the operationalization of an innovative wave model; carried out model validation against field observations of wave transformation against field (Petten) and experimental measurements.	
PROJECT:	**Wave height distribution for design of maritime structures with a shallow Foreland.**
Year:	1999
Location:	The Netherlands
Client:	Private, in-house research of Splash Hydrodynamics
Positions held:	Coastal Modelling Expert
Activities performed: Numerically simulated realistic sea-state transformation on shallow foreland, analyzed experimental data, validated model simulation against data; Formulated wave-height distribution towards a new design guideline, dissemination in *Int. Conf.* '*Coastal Structures*'	
PROJECT:	**Numerical implementation of a one-dimensional higher-order Boussinesq model for wave modelling, Netherlands.**
Year:	1999
Location:	The Netherlands
Client:	Private, in-house research of Splash Hydrodynamics
Positions held:	R&D Consultant
Activities performed: Developed and implemented a time-domain numerical model of a one-dimensional nonlinear (higher-order Boussinesq model) model, validated against analytical and experimental data for use in improved wave prediction for design and analysis.	
PROJECT:	**Wave height magnification, reflection and transmission due to a current in coastal areas**
Year:	1997-1998
Location:	Denmark
Client:	Danish Science Foundation through ICCH/DHI (DK).
Positions held:	Senior Research Engineer (Coastal Processes)
Activities performed: Developed mathematical and numerical modelling tools for the purpose, analyzed the wave transformation process in the presence of an ambient current, provided validation against observations and experimental data.	
PROJECT:	**Nonlinear description of shallow water waves through Hamiltonian formulation**
Year:	1996
Location:	The Netherlands
Client:	RIKZ-Dutch Public Works (NL) through Delft Hydraulics
Positions held:	R&D Engineer and Project Leader (Harbours, Coastal and Offshore Engineering)

Activities performed: Development of numerical framework and implementation for a predictive operational tool for wave transformation based on the higher-order approximation of the exact Hamiltonian.	
PROJECT:	**Re-habilitation of Nickerierivier-Rijsdijksluis Revetment in Surinam for DGIS, The Netherlands.**
Year:	1996
Location:	Surinam, South America
Client:	DGIS, The Netherlands. through Delft Hydraulics
Positions held:	R&D Engineer (Harbours, Coastal and Offshore Engineering)
Activities performed: Reviewed the historical met-ocean conditions and specified met-ocean design conditions, analyzed local area estuary morphology and selected critical bathymetry for wave transformation, computed wave transformation with assessed Sea Level Rise for specifying the design conditions for the revetment.	
PROJECT:	**Wave transformation and tranquility in harbours and coastal areas through numerical modelling for RIKZ-Dutch Public Works (NL)**
Year:	1995
Location:	The Netherlands
Client:	RIKZ-Dutch Public Works (NL) through Delft Hydraulics
Positions held:	R&D Engineer (Harbours, Coastal and Offshore Engineering)
Activities performed: Performed application analysis and assessment of model performance in cases of (a) Wave penetration and harbour tranquility in Haringvliet, The Netherlands; (b) Influence of current on wave propagation around a semi-detached offshore breakwater; (c) Offshore to near-shore wave transformation over a complex shallow bathymetry of shoals, islands and sea-channels of Friesche Zeegat.	
PROJECT:	**Design of laying of a sea-bed pipeline passing over a reef between East Spar & Varanus, Australia**
Year:	1995
Location:	Australia
Client:	A private consulting company of Australia through Delft Hydraulics
Positions held:	R&D Engineer (Harbours, Coastal and Offshore Engineering)
Activities performed: Reviewed local met-ocean conditions and selected critical cases for wave-loading for a pipeline on a sea-bed slope; Computed loading by predicted kinematics by fully nonlinear intra-wave resolution of velocity and acceleration incorporating wave transformation over a slope, assess stability of the free pipeline.	
PROJECT:	**European Commission MAST programme, Reliability of Boussinesq-like models for predicting wave motion in coastal waters.**
Year:	1994
Location:	The Netherlands
Client:	European Commission through Delft Hydraulics
Positions held:	R&D Engineer (Harbours, Coastal and Offshore Engineering)
Activities performed: Performed analysis of dispersive characteristics of the model equations; selection of critical bench-mark cases; inter-comparison of computed results and validation against lab measurements with respect to nonlinear shoaling, harmonic generation and propagation.	
PROJECT:	**Time-domain (Numerical) modelling of nonlinear wave transformation in coastal waters based on advanced approximation of Hamiltonian for RIKZ-Dutch Public Works (NL).**
Year:	1994
Location:	The Netherlands
Client:	RIKZ-Dutch Public Works (NL) through Delft Hydraulics
Positions held:	R&D Engineer and Project Leader (Harbours, Coastal and Offshore Engineering)
Activities performed: Formulated & implemented the numerical model, established its applicability to nonlinear wave transformation.	
PROJECT:	**Planning of new terminals layout and alignment of new waterways of Europoort (Rotterdam Port)**
Year:	1994
Location:	The Netherlands
Client:	DGW-Dutch Public Works (NL) through Delft Hydraulics
Positions held:	R&D Engineer and Project Leader (Harbours, Coastal and Offshore Engineering)
Activities performed: Performed analysis of met-ocean conditions for long-waves and atmosphere-induced surge, formulation of entrance loss in modelling of long-wave response as a key parameter, guided of setting-up of the frequency-domain model PHAROS and time-domain flow model TRISULA for investigating harbour response to long-wave forcing, prescribed physical interpretation and engineering implications of model results for designing expansion layout of Europoort (Rotterdam Port) with respect to resonance, seiches and quay-wall flooding.	
PROJECT:	**Technology Upgradation of Experimental Facilities- Strategic Development Initiative, Delft Hydraulics (NL)**

Year:	1993
Location:	The Netherlands
Client:	Delft Hydraulics (NL)
Positions held:	R&D Engineer (Harbours, Coastal and Offshore Engineering)
Activities performed: Developed and implemented a new algorithm for higher-order wave-generation with reduction of spurious sub and super harmonic waves.	
PROJECT:	**Vertical structure of the (temporal) mean flow due to combined waves and currents in the coastal environments.**
Year:	1993
Location:	The Netherlands
Client:	RIKZ-Dutch Public Works (NL) and European Commission MAST Programme
Positions held:	R&D Engineer (Harbours, Coastal and Offshore Engineering)
Activities performed: Numerical investigation and verification of vertical distribution of wave-influenced currents against experimental measurement.	
PROJECT:	**RIKZ-Dutch Public Works (NL) Specification of design wave conditions for coastal infrastructures along the Dutch coast.**
Year:	1993
Location:	The Netherlands
Client:	RIKZ-Dutch Public Works (NL)
Positions held:	R&D Engineer (Harbours, Coastal and Offshore Engineering)
Activities performed: Analyzed 40 year data of measured wave elevation, formulated proper statistical procedure for robust estimation of significant wave height and specified wave conditions at appropriate exceedance frequencies for design of coastal structures.	
PROJECT:	**Large-Scale Experimental Investigation of Forces on cylinders due to combined action of waves and currents.**
Year:	1992-1993
Location:	The Netherlands
Client:	European Commission (LIP) through Delft Hydraulics
Positions held:	R&D Engineer and Project Leader (Harbours, Coastal and Offshore Engineering)
Activities performed: Designed experimental infrastructure & data collection facilities, Planned instrumental operation for experimental runs, Guided visiting scientists on the experimental program and collaborated on analysis for developing new guidelines.	
PROJECT:	**DGW-Dutch Public Works (NL), Computation of Turbulent Flow features and Bed-Scour downstream of a hard structures**
Year:	1992
Location:	The Netherlands
Client:	DGW-Dutch Public Works (NL),
Positions held:	R&D Engineer (Harbours, Coastal and Offshore Engineering)
Activities performed: Set-up an integrated turbulence flow model and bed change due to non-uniform sediment transport for the computation, delivered outcomes of flow features, turbulence intensity and evolution of the scour hole downstream of a hard structure simulating the condition of a river bed erosion downstream of a concrete apron.	
PROJECT:	**Forecasting of safe time window for sea-bed pipelaying operation**
Year:	1992
Location:	The Netherlands
Client:	Stat Oil, Norway
Positions held:	R&D Engineer (Harbours, Coastal and Offshore Engineering)
Activities performed: Prepared a computational algorithm module for predicting the allowable current and wave parameters against stability of a pipeline during the seabed laying operation near the landfall. This module was linked to the forecast values of current and wave parameters at the site to project a safe time window for the pipeline laying operation in the German Wadden Sea.	
PROJECT:	**Turbulent Flow features, Bed-Scour and Self-Burial of a pipeline on the sea-bed**
Year:	1991
Location:	The Netherlands
Client:	Delft Hydraulics (NL)
Positions held:	R&D Engineer and Project leader (Harbours, Coastal and Offshore Engineering)
Activities performed: Prepared a semi-empirical predictive instrument to predict initiation of scour and development rate of a scour hole underneath a sea-bed pipeline and the change of flow features with the evolution of the scour hole. The system was based on compilation of available experimental results and results	

from a turbulent flow model (k-Ɛ turbulence model) integrated with bed-change due to non-uniform sediment transport through bedload and suspension.	
PROJECT:	**Evolution of scour holes and turbulent flow features under the free-span of a sea-bed pipe line- Strategic Development Initiative, Delft Hydraulics (NL)**
Year:	1991
Location:	The Netherlands
Client:	Delft Hydraulics (NL) SDI
Positions held:	R&D Engineer and Project leader (Harbours, Coastal and Offshore Engineering)
Activities performed: Implemented a turbulent flow model (k-Ɛ turbulence model) for cross-flow to a pipe over a bed profile of arbitrary shape with a small gap, integrated a bed-change module due to non-uniform sediment transport through bedload and suspension by linking it to the flow variables from the turbulence flow model. The flow features were used to analyse flow separation, vortex shedding depending on the gap from the bed.	

11. Publications

Books :

Dingemans, M.W. & A.K. Otta (2001). Nonlinear modulation of water waves, in *Advances in Coastal and Ocean Engineering*, vol. 7: 1-72, ed. P.L.-F. Liu, World Scientific co, Singapore.

Technical journals :

- Otta, A.K. & S. Roy (2024). Construction of a synthetic super-cyclone and modelling of resulting coastal waves for assessing engineering impacts at a proposed port site off the eastern coast of India, *in preparation*.
- Wang, B., A. Chadwick & A.K. Otta (2008). Derivation and application of new equations for radiation stress and volume flux, *Coastal Engineering*, Elsevier; 55(4): 302-318.
- Wang, B., A.K. Otta & A. Chadwick (2007). Transmission of obliquely incident waves at low-crested breakwaters: theoretical interpretations of experimental observations, *Coastal Engineering*, Elsevier, 54: 333-344.
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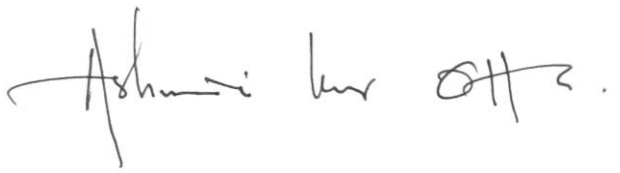
Others	:	• 'Historic climate data and data zoning' and 'Climate change projection and vulnerability analysis' for Port Framework of Papua New Guinea, prepared for and approved by Asian Development Bank and Government of Papua New Guinea. • 14 Technical monographs on strategic R&D and consultancy projects in Delft Hydraulics, The Netherlands. • Nine design reports on innovative coastal protection schemes, prepared for and approved by the Asian Development Bank (ADB) and Government of Karnataka, India. • Doctoral dissertation 'Unsteady free surface waves in a region of arbitrary shape', University of Delaware, USA • Master's thesis 'Prediction of rip-rap stability on rough slopes, University of Delaware, USA

12. Certification:

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes me, my qualifications, and my experience.



Date: 20/09/2024

[Signature of Key Expert]

(Day / Month / Year)