

RESUME



National Institute of Technology, Delhi

Personal Information

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Date of Birth : 23rd Febuary 1982
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Education Qualification

B. Sc. (1998~2001) :With Mathematics, Physics and Chemistry , from M. J. P. Rohilkhand University India, Result: 71.70/100.

P.G. diploma (2002~2003)

:With Computer Application from LBS Technical Training Institute Ghaziabad India, CGPA 8/10.

M. Sc. (2003~2005) :With Mathematics from Indian Institute of Technology (IIT), Delhi, CGPA 6.77/10.

Integrated Ph.D. (MS+Ph.D.) (2007~ 2013)

:With Applied Mathematics from POSTECH, Pohang, South Korea (POSTECH rank one in top 100 universities under 50

year old in the world and top 10 universities in Asia (Times Higher Education (THE) survey, CGPA 3.77/4.

Thesis title : Modeling and Simulation for Wave Induced Oscillation in a Geometrically Arbitrary Domain with Corner Contribution and Chebyshev Point Discretization.

Research Associate (1st January 2014 ~ 28th February 2014)

: Department of Mathematics, POSTECH, Pohang, South Korea,

Post Doctoral Fellow (1st March 2014~ 14th January 2015)

: Climate Change Research laboratory (CCRL), POSTECH, Pohang, South Korea.

Research Interest : **Computational Fluid Dynamics**: Modeling and Simulation of Multidirectional Random Ocean Waves, Linear and Weakly Non-linear waves, Wave Spectrum Analysis, Coastal Harbor Hazards problems.

Numerical Methods: Boundary Element Method (BEM), Finite Element Method, Spectral Method, Chebyshev Point Discretization.

Climate Modeling: Global Ocean Wave Height analysis, Influence of Climate variability on Ocean wave height such as El Niño Southern Oscillation (ENSO), Pacific Decadal Oscillation (PDO) and North Atlantic Oscillation (NAO).

Membership : Society of Industrial and Applied Mathematics (**SIAM**), Korean Mathematical Society (**KMS**) and Korean Society of Industrial and Applied Mathematics (**KSIAM**).

Significant Academic Projects

Prof. Kim Kwang Ik

(Academic advisor, Dept. of Mathematics, POSTECH) (June 2008~July 2011)

POSCO Harbor Project, Pohang, South Korea

- Worked on mathematical modeling for Pohang New Harbor (PNH) to analyze the wave hazards during the seasonal weather conditions.
- A novel numerical scheme developed to determine the resonance inside the PNH with extreme weather conditions at various key recorder points.

- A mathematical model is developed for the analysis of refraction and diffraction of multidirectional random non-linear waves in the PNH.

Prof. Manju Mohan, (July 2005~Dec. 2005)

Centre of Atmospheric Science, I.I.T. Delhi India

- Numerical simulation of the plume behavior of stake height at various atmospheric conditions.

Prof. R. C. Raghava (January 2005-June 2005)

Centre of Atmospheric Science, I.I.T. Delhi India

- My M.Sc. project “**Post processing of numerical simulations of atmospheric process**” based on weather prediction, studied the ECMWF (European Centre for Medium Range Weather Forecasting) model and Primitive Equation Model).

Summary of Domestic and International Conference Talks

- **Mathematical Problems in Engineering, Aerospace and Sciences University of Genoa, Italy on June 25th-27th 2008**, and the title “*Theoretical analysis of wave oscillation of arbitrary shaped harbor*”.
- **2009 Joint meeting of KMS and AMS, Ewha Women’s University, Seoul, Korea on 16th -20th December 2009**, and the title “*Theoretical analysis and model based simulation to resolve the cause of POSCO New Harbor hazards*”.
- **International Conference on Challenges and Applications of Mathematics in Science and Technology (CAMIST-2010), organized by Department of Mathematics, NIT ROURKELA India on 11th13th January 2010**, and the title “*Theoretical analysis and model based simulation of the POSCO New Harbor and the modified POSCO New Harbor.*”
- **International Congress of Mathematics (ICM-2010) Hyderabad India on 19th-27th August 2010**, and the title “*A moored ship motion analysis with the resonant frequency waves in the POSCO New Harbor*”.
- **2010 Global KMS International Conference, POSTECH, Pohang on 22nd-23rd October 2010**, and the title “*Wave-Induced Ship Motion*”

Analysis in the POSCO New Harbor via Helmholtz Equation with Numerical Simulations".

- **KMS Fall Meeting 2011, Kyungpuk National University, Daegu, South Korea on 21st-22nd October 2011**, and the title "The Boundary Integral Method for the Computation of Linearized Ocean Surface Wave Fields in a Highly Irregular Bounded Geometry"
- **KMS Spring Meeting 2012 Sookmyung Women's University Seoul on 28th April 2012**, and the title "*Spectral density analysis of the Pohang new harbor*".
- **International Conference on Mathematical Modeling and Applied Soft Computing (MMASC-2012), Coimbatore India on 11th-13th July 2012**, and the title "*Numerical Simulation of the Pohang New Harbor for Sciche Reduction*".
- **Mathematical Society of Japan (MSJ) Autumn Meeting 2012, Kyushu University, Fukuoka, Japan on 18th-22nd Sep. 2012**, and the title "*Mathematical modeling of the ship hydrodynamics in Pohang New Harbor*".
- **KSIAM conference at Kyungpook National University, Daegu on 23rd-24th Nov. 2012**, and the title "*SPECTRAL DENSITY ANALYSIS OF A MOORED SHIP MOTION IN POHANG NEW HARBOR.*"
- **The Asian Mathematical Conference (AMC-2013) at BEXCO center, Busan, South Korea on 30th June-4th July 2013**, and the title "*A moored ship motion analysis in arbitrary harbor geometry with various directional incident waves*".
- **7th International conference on Mathematical Science for Advancement of Science and Technology (MSAST 2013), Kolkata, India on 21st -23rd December 2013**, and the title "*A 3-D Boundary Element Model to Analyze the Multidirectional Random wave diffraction in a Harbor with Complex Geometry.*"
- **2015 Climate Variability Workshop, School of Environment Science and Engineering, POSTECH, Pohang, South Korea, on 12th-13th January 2015**, and the title "*Influence of Climate variability modes.*"

List of publications

- Kumar, P., Zhang, H., Kim, K.I. (2013). *Spectral Density Analysis for Wave Characteristics in Pohang New Harbor*, **Journal of Pure and Applied Geophysics (PAGEOPH)**, vol. 171, issue-7, pp. 1169-1185 (SCI).
- Kumar, P., Zhang, H., Kim, K.I., Yuen, D.A. (2013). *Wave field analysis in a harbor with irregular geometry through boundary integral of Helmholtz equation with corner contributions*, **Computer & Fluids**, vol. 88, pp. 287-297 (SCI).
- Kumar, P., Zhang, H., Kim, K.I., Yuen, D.A., Shi, Y. (2014). *Modeling wave spectra of multidirectional random ocean waves in a harbor through combination of boundary integral of Helmholtz equation with Chebyshev point discretization.*” in the **Computer & Fluids**, vol. 108, pp. 13-24 (SCI).
- Kumar, P., Zhang, H., Kim, K.I., Yuen, D.A. (2015). *Modeling and simulation of a moored ship motion in Pohang New Harbor under the resonance conditions* **submitted in Journal of Geophysical Research (JGR): Ocean**. Date of submission: 2014-12-21 (SCI).
- **In Preparation:** Kumar P., Min, S.K., Wang X., (2015), *Influence of Climate Variability on Extreme Ocean Wave Height Assessed From ERA-Interim and ERA40 Reanalyses*.

Teaching Assistantship

- **Courses (2007~2013):** Regular teaching assistant of Calculus-I, Calculus-II, Applied linear algebra, Mathematical analysis, Applied numerical analysis, applied complex variables, Different equations, Probability and statics.
- **Hilbert classes (2009~2013):** Every semester Hilbert classes are taken to teach undergraduate student for solving mathematics problems in various courses.
- **Lecturer (2006~2007):** Taught **Mathematics-I and Mathematics-II** as lecturer in Sachdeva Institute of Technology, Mathura, UP, India.

Academic Recommendation

- **Prof. Kim Kwang Ik (Professor, Academic advisor):** Department of Mathematics, POSTECH, Pohang, South Korea.
Email: kimki@postech.ac.kr, Ph. No: +82-10-5370-2044

- **Prof. Jae Ryong Kweon (Professor):** Department of Mathematics, POSTECH, Pohang, South Korea-790784.
Email: kweon@postech.ac.kr, Ph. No: +82-54-279-2053
- **Prof. Huai Zhang (Professor):** Excusive Director Laboratory of Computational Geodynamics, University of Chinese Academy of Sciences, Beijing 100049, P.R. China.
Email: h Zhang@ucas.ac.cn, huaizhang@gmail.com.
- **Prof. Seung Ki Min (Associate Professor):** Climate Change Research Laboratory (CCRL), POSTECH, Pohang, South Korea-790784.
Email: skmin@postech.ac.kr .

Leadership Skills

- Selected as International Student Representative of Indian graduate students in POSTECH by election held in POSTECH for year 2012-2013.
- Working in DICE (Dorm of International and Cultural Exchange) as leader of India and worked as coordinator in multicultural International events in the years 2007~2010.

Collaborators

- **Prof Seung Ki Min Laboratory,** Climate Change Research Laboratory (CCRL), POSTECH, South Korea.
Web: <http://climatechange.postech.ac.kr/>
- **Prof Huai Zhang Laboratory,** Laboratory of Computational Geodynamics, University of Chinese Academy of Sciences, Beijing 100049, P.R. China.
Web: <http://gdlab.gucas.ac.cn/>
- **Prof. David A Yuen Laboratory,** Department of Geology and Geophysics, University of Minnesota, Minneapolis, MN 55455, USA.
Web: <http://www.msi.umn.edu/~davey/>

Declaration

I declare that all the information given above is true to the best of my knowledge.

Prashant Kumar

Date: 2015-01-20