BANDARU GOUTHAM RAJEEV GANDHI

B.Tech (Civil), JNTU Kakinada, Andhra Pradesh
M.Tech (Water Resources Engineering), IIT Guwahati, Assam
PhD (Ongoing), IIT Guwahati, Assam
Assistant Professor, GBPIET
Department of Civil Engineering

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Degree	Institute	CGPA/%	Years
Ph.D.	Indian Institute of Technology Guwahati	NA	*2016-Ongoing*
M.Tech.	Indian Institute of Technology Guwahati	9.89	*2013-2015*
B.Tech.	Jawaharlal Nehru Technological University Kakinada	81.68%	*2009-2013*

CURRENT RESEARCH

Detection and Management of Virus Sources in Groundwater under Equilibrium and Kinetic Sorption
From July 2016

PhD Supervisor: *Prof. Rajib Kumar Bhattacharjya, Professor in Department of Civil Engineering, IIT Guwahati.*

- To develop a numerical simulation model which accounts for all the heterogeneities in aquifer medium and other factors such as Temperature, pH and Solution chemistry etc.
- To develop an inverse optimization model that can identify the potential source strengths of virus.
- To develop an optimal management strategy by altering the parameters that effect the deposition and inactivation of viruses through Darcy scale models.
- To develop a pore-scale model for virus transport.
- To develop a management model to find the optimal injection rate of collector efficient Nano-particles for removal of viruses.

RESEARCH PUBLICATIONS

Simulation-optimization based virus source identification model for 3D unconfined aquifer considering source locations and number as variable.
August 2016

Authors: *Rajeev Gandhi BG, Research Scholar, Department of Civil Engineering, IIT Guwahati.*
Prof. Rajib Kumar Bhattacharjya, Professor in Department of Civil Engineering, IIT Guwahati.
Prof. Mysore G. Satish, Department of Civil and Resource Engineering, Dalhousie University.

- In this paper we have given a methodology to identify the virus sources as industrial effluents and as leakages from a sewer line.

Rajeev Gandhi, B.G., Bhattacharjya, R.K. and Satish, M.G. 2016. Simulation-optimization based virus source identification model for 3D unconfined aquifer considering source locations and number as variable. J. Hazard. Toxic Radioact. Waste, 04016019 1-12. doi: 10.1061/(ASCE)HZ.2153-5515.0000334.

Management of Virus Concentrations in an Unconfined Aquifer by Varying the Temperature of the Fluid in the Aquifer.
In Communication

Authors: *Rajeev Gandhi BG, Research Scholar, Department of Civil Engineering, IIT Guwahati.*
Prof. Rajib Kumar Bhattacharjya, Professor in Department of Civil Engineering, IIT Guwahati.

- In this paper we have given a methodology to couple virus transport and heat transport equations to remediate the aquifer in-situ by injection of hot water at selected locations.

Determination of Illegal Pumping and Monitoring Network using Genetic Algorithm based Simulation-Optimization model.
September 2015

Authors: *Arnesh Das, Former B.Tech. Graduate, Department of Civil Engineering, Delhi College of Engineering.*
Rajeev Gandhi BG, Research Scholar, Department of Civil Engineering, IIT Guwahati.
Prof. Rajib Kumar Bhattacharjya, Professor in Department of Civil Engineering, IIT Guwahati.

- In this paper we have proposed a methodology to determine a monitoring network to determine the strength and location of illegal pumping.

Arnesh Das, Rajeev Gandhi BG, Rajib Kumar Bhattacharjya, 2015, "Determination of illegal pumping and monitoring network using genetic algorithm based simulation-optimization model." Third Intl. Conf. on Advances in Civil, Structural and Environmental Engineering – ACSEE.

Detection of Illegal Groundwater Pumping – Modelling and Experimental Verification.
December 2016

Authors: *Rajeev Gandhi BG, Research Scholar, Department of Civil Engineering, IIT Guwahati.*
P.N.V. Manikanta, G. Vema Reddy, U. Girish Kumar, K. Vijay Babu, M. Rahimunisa Begum, Y.S. Sai Kiran.
Former B.Tech. Graduates, Department of Civil Engineering, Anil Neerukonda Institute of Technology and Sciences, Visakhapatnam.

- In this paper we have experimentally verified the model for illegal groundwater pumping using a 3-Dimensional flow model and optimization using genetic algorithms.

Rajeev Gandhi BG, Manikanta PNV, Vema Reddy G, Girish Kumar U, Vijay Babu K, Rahimunisa Begum M, Sai Kiran Y S. "Detection of illegal groundwater pumping – modelling and experimental verification." 21st Intl. Conf. on Hydraulics, Water Resources and Coastal Engineering, Hydro 2016.

BOOK CHAPTERS

Differential Evolution and its application in Identification of Virus Release Location in a Sewer Line
October 2019

Authors: *Rajeev Gandhi BG, Research Scholar, Department of Civil Engineering, IIT Guwahati.*
Prof. Rajib Kumar Bhattacharjya, Professor, Department of Civil Engineering, IIT Guwahati.

- The title of the book is Metaheuristic Optimization Methods: Algorithms and Engineering Applications
- In this book chapter, the differential evolution algorithm is discussed in detail and the application of the algorithm to detect the virus release location in a sewer line is solved as an example.

Introduction to shuffled frog leaping algorithm and its sensitivity to the parameters of the algorithm
October 2019

Authors: *Rajeev Gandhi BG, Research Scholar, Department of Civil Engineering, IIT Guwahati.*
Prof. Rajib Kumar Bhattacharjya, Professor, Department of Civil Engineering, IIT Guwahati.

- The title of the book is Metaheuristic Optimization Methods: Algorithms and Engineering Applications
- In this chapter the shuffled frog leaping algorithm is discussed in detail and the sensitivity of the parameters in the algorithm are also analysed.

Firefly Algorithm and its Applications in Engineering Optimization
October 2019

Authors: *Dilip Kumar, Assistant Professor, Department of Civil Engineering, G.B. Pant Engineerng College, Pauri, Uttarakhand.*
Rajeev Gandhi BG, Research Scholar, Department of Civil Engineering, IIT Guwahati.
Prof. Rajib Kumar Bhattacharjya, Professor, Department of Civil Engineering, IIT Guwahati.

- The title of the book is Metaheuristic Optimization Methods: Algorithms and Engineering Applications
- In this chapter, the firefly algorithm is discussed and the applications of the algorithm over the test functions of optimization is discussed.

Introduction to Invasive Weed Optimization Method
October 2019

Authors: *Dilip Kumar, Assistant Professor, Department of Civil Engineering, G.B. Pant Engineerng College, Pauri, Uttarakhand.*

Rajeev Gandhi BG, Research Scholar, Department of Civil Engineering, IIT Guwahati.
Prof. Rajib Kumar Bhattacharjya, Professor, Department of Civil Engineering, IIT Guwahati.

- The title of the book is Metaheuristic Optimization Methods: Algorithms and Engineering Applications.
- In this chapter, the invasive weed growth process is used as an optimization technique to solve various engineering optimization problems.

PROJECTS

Design of water conveyance system for National Institute of Pharmaceutical Education and Research (NIPER), Guwahati
September 2018 to January 2019

Consultancy Project: *Prof. Rajib Kumar Bhattacharjya, Professor in Department of Civil Engineering, IIT Guwahati.*

- Determining the location of the pumps, pipe junctions and the size of the conveyance tanks for the water distribution system.
- Determination the optimal time of operation of the pumps ensuring the sufficient recharge time for each pump in operation for groundwater pumping.

Hydraulic Transient Analysis for water pipe line at National Thermal Power Corporation (NTPC), Gadarwara
November 2016 to May 2017

Consultancy Project: *Prof. Arup Kumar Sharma, Professor in Department of Civil Engineering, IIT Guwahati.*
Prof. Rajib Kumar Bhattacharjya, Professor in Department of Civil Engineering, IIT Guwahati.

- Development of a thorough hydraulic transient analysis code in MATLAB using the finite difference scheme by method of characteristics.
- Determination the optimal number and location of air valves so that the pipeline is subjected to minimum vacuum pressure when valves are closed or pumps fail.

Detection and Management of Virus Sources in Groundwater Aquifer
July 2014-July 2015

Masters Thesis Project: *Prof. Rajib Kumar Bhattacharjya, Professor in Department of Civil Engineering, IIT Guwahati.*

- Source identification model to detect the potential sources of virus at industrial effluents and sewer lines in an unconfined aquifer using inverse optimization techniques and direct search.
- Management model to reduce the concentration of virus in the aquifer altering the inactivation in the virus using optimization and genetic algorithms.

Planning and Design of Rural Road from Nadipudi Village to Molletiguruvu
December 2012-May 2013

Bachelors Thesis Project: *Dr. Ramu, Professor in Department of Civil Engineering. JNTU, Kakinada, Andhra Pradesh.*
Er.. Rambabu, Assistant Engineer, Amalapuram, Andhra Pradesh.

- The project has been tied up with the Government in laying the rural road with the design done by the members of our group and compared with their design considering all the parameters.

EXPERIENCES

Assistant Professor
13-08-2015 to 23-04-2016

*Anil Neerukonda Institute of Technology and Sciences, Visakhapatnam, Andhra Pradesh, **India***

- Taught the courses **Water resources engineering** and **Irrigation Structures Design and Drawing** for undergraduates IV/IV year of Bachelor of Engineering
- Taught a Laboratory course for **Fluid Mechanics and Hydraulic Machines** for undergraduates II/IV year of Bachelor of Engineering.

Visiting Scholar
15-09-2014 to 15-11-2014

*Dr. M G Satish, Professor in Civil and Resource Engineering, Dalhousie University, Halifax, NS, **Canada**.*

- Visiting Scholar at Dalhousie University to continue the research on the **modelling of virus transport in porous media using MATLAB** under the guidance of Dr. M G Satish.
- Three dimensional transport of virus is modelled using MATLAB and the results are **validated with the MT3DMS** module in Groundwater Modelling Software.

Summer Intern   *07-06-2012 to 15-06-2012*

*Executive Engineer, Greater Visakhapatnam Municipal Corporation, Andhra Pradesh, **India***

- Took part in a one week Industrial Training Program for the Construction of Flyover Work connecting the Railway Station and the Bus Station in Visakhapatnam.
- The materials used, type of soil, footing design, abutments stability and variation of foundations for various types of soils have been discussed.

SPECIAL COURSES

Groundwater Flow and Transport Modelling through Fractured Geologic Media *27-06-2016 to 08-07-2016*

*Prof. Walter A. Illman, University of Waterloo, **Canada***
*Dr. K.B.V.N. Phanindra, Asst. Professor, Indian Institute of technology Hyderabad, **India***

- Participated in the international credit course under Global Initiative for Academic Network (GIAN) and secured Excellent (10 CGPA) grade points, organized at Indian Institute of Technology Hyderabad.

- The Course dealt with the basic modelling differences with the porous media and the fractured geologic media. Advanced techniques in determining the hydraulic conductivity of any media using hydraulic tomography and electrical resistivity are emphasized.

Water Resource Management and Climate Change Impacts   *22-12-2014 to 26-12-2014*

*Dr. M.K. Goyal, Asst. Professor, Indian Institute of technology Guwahati, Assam, **India***

- Participated in the national course under Technical Education and Quality Improvement Programme sponsored by the Ministry of Human Resource Development and Government of India.
- The course dealt with various impacts of climate change, downscaling the various Global Climatological Models (GCM), importance of Regional Climatological Modes (RCM) as main emphasis.

KEY COURSES

• Subsurface Hydrology • Computational Methods in Hydraulic and Environmental Engineering • Introduction to Multiphase flow in Porous Media	• Optimization Methods • Advanced Fluid Mechanics • Advanced Hydraulic Engineering • Water Resources planning and Management

ACHIEVEMENTS

- Secured State 8th mark in Junior Intermediate, 2008.
- Secured rank 1113 in Graduate Aptitude Test for Engineering (GATE), 2013.

TECHNICAL PROFICIENCY

- Basics in 'C' language
- GMS (Groundwater Modelling Software)
- MATLAB

POSITIONS OF RESPONSIBILITY

Student Committee member for the OCTAVIA college Magazine JNTUK   *2013*

- Organizing and collection of the photographs of laboratories, paintings and poems by students to be printed in the College Magazine.

Organized of a One Day Workshop   *2013*

- Organized the workshop attended by 120 students on Waste Water Engineering and Citizen's Role in reducing Carbon Footprints by Dr. KVSG Murali Krishna.
- Student committee member for the first and second Edition of the book 'Joy of Engineering' published for workshop.

EXTRA CURRICULARS

- First Prize in the Fashion Show in ADVAYA 2014 and participated in Fashion Show in ADVAYA 2015, the PG Cultural fest held at IIT Guwahati
- Participated and won the award of excellence for 'Best Feasible Idea for Smarter Planet' in the event SHRUSTI 2010, held at JNTU Kakinada.