Morteza Zanganeh

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Personal Information

Nationality:	Iranian
Date of Birth:	July 13, 1980
Place of Birth:	Golestan, Iran
Gender:	Male
Marital Status:	Single

Educational Background

2006-2012   Iran University of Science and Technology (IUST), Tehran, Iran,

Ph.D. Civil Engineering, Water Engineering (Coastal Engineering)

Dissertation: *"Two-phase modeling of current-induced scour beneath pipelines via combined Smoothed Particle Hydrodynamics and Distinct Element Method".*

2003-2006   Iran University of Science and Technology (IUST), Tehran, Iran,

M.Sc., Civil Engineering, Water Engineering (Coastal Engineering)

Thesis: *"A combined model of Fuzzy Inference Systems and Genetic Algorithm (FIS-GA) for prediction of wave parameters and its comparison with ANFIS and empirical methods".*

1999-2003   Isfahan University of Technology (IUT), Isfahan, Iran,

B.S., Civil Engineering.

1994-1998   NabiAkram High School, Golestan, Aliabad, 1998,

High School Diploma, Mathematical Sciences

Research Interests

- Coastal Stabilization and Beach Nourishment
- Coastal and Marine Structures
- Modeling of Wave and Marine Currents
- Two-phase Flow Modeling and Turbulence Modeling
- Sea Water Intake Including Deep water, Infiltration Galleries and Outfall System
- Application of Soft Computing Methods in Marine Events Prediction (ANN, GA-FIS, PSO-FIS, GP and COA)

Teaching Courses

- Fluid Mechanics
- Open Chanel Hydraulics
- Water Convening System
- Sewer and Storm water Network System Design
- Water Quality and Environmental Engineering

Publications

Journal Papers

1. Zanganeh, M., Mousavi, S.J., and Etemad Shahidi .A (2009), "A Hybrid Genetic Algorithm-Adaptive-Network-Based Fuzzy Inference System for Prediction of Wave Parameters" *Journal of Engineering Application of Artificial Intelligence (EAAI), ELSEVIER, 22, 1194-1202.*

2. Zanganeh, M., Yeganeh-Bakhtiyari, Bakhtyar R. (2011)" Combined Particle Swarm optimization and Fuzzy Inference System Model for Estimation of Current-induced Scour beneath Pipelines". *Journal of Hydro Informatics, IWA publishing, 44: 27-37.*

3. Ayoubloo M. K., Azamathulla H. Md., Jabbari E. and Zanganeh, M., (2011) "Predictive Model-based for the Critical Submergence of Horizontal Intakes in Open Channel Flows with Different Clearance Bottoms Using CART, ANN and Linear Regression Approaches", *Journal of Expert Systems with Applications, ELSEVIER, Volume 38, Issue 8, Pages 10114‑10123.*

4   Zanganeh, M., Yeganeh-Bakhtiray. A., and Abd Wahab A.K.(2012) "Lagrangian Coupling Two-phase Flow Model to Simulate Current–Induced Scour beneath Marine Pipelines" *Journal of Applied Ocean Research, ELSEVIER, Volume 38, Pages 64-73.*

5   Kazemi E., Zanganeh M., Yeganeh-Bakhtiary A. and Houshangi H. (2012) "Two-Phase Flow Modeling of Bed-Load Transport Using A Lagrangian-Lagrangian Model", *International Journal of Maritime Technology (in Persian), 7(14): 71-87.*

6   Yeganeh-Bakhtiary A., Zanganeh M., Kazemi E., Cheng L. and Abd Wahab A.K. (2013) "Euler-Lagrange Two-phase Model for Simulating Live-bed Scour Beneath Marine Pipelines", *Journal of Offshore Mechanics and Arctic Engineering (OMAE), ASME, 135(3): 031705.*

7   Zanganeh M., Yeganeh-Bakhtiary A. and Yamashita T. (2016) "ANFIS and ANN Models for the Estimation of Wind and Wave-induced Current Velocities at Joeutsu-Ogata coast", *Journal of Hydro Informatics, IWA publishing, 18 (2), 371-391.*

8   Zanganeh M. and Meraji H. (2017)." Numerical Modeling of Dewatering System to Construct Pump Basins in Open Sea Water Intake System by MODFLOW", *Iranian Journal of Soil and Water Research 48 (2), 428-417 (in Persian).*

9   Zanganeh, M., (2017). Simultaneous Optimization of Clustering and Fuzzy IF-THEN Rules Parameters by the Genetic Algorithm in Fuzzy Inference System-based Wave Predictor Models. *Journal of Hydroinformatics, 19 (3), 385-404.*

10   Zanganeh M. and Hajmomeni A. (2016)" Modeling of Siltation at Bushehr Estuary by MIKE 21", *International Journal of Maritime Technology (in Persian), 23: 25-35.*

11   Zanganeh M. (2020)" Improvement of the ANFIS-based Wave Predictor Models by the Particle Swarm Optimization", *Journal of Ocean Engineering and Science*, *ELSEVIER, 5, no. 1: 84-99.*

12   Zanganeh M., (2021)" Estimation of Flushing Time in Semi-Enclosed Water Bodies through a Lumped and Distributed Aspects (Case Study: Chabahar Bay)" *International Journal of Maritime Technology (in Persian)*, 85-96.

13   Zanganeh M., (2021)" Numerical Simulation of Flood Inundation around Aq Qala Industrial State and Remedies for its Protection ", *Journal of Hydraulic Engineering (in Persian).*

14   Zanganeh M and Chaji A, (2021)" Combined Approximate Entropy Model and ANNs to Predict Inflow at Gorganrood River ", *Journal of Civil engineering (in Persian), Sharif University, Accepted.*

15   Zanganeh M. and Rastegar.A. (2021)" Estimation of Roughness Coefficient in Erodible Channels by ANNs and the ANFIS Methods", Amirkabir University Civil Engineering Journal (*in Persian*), *52 (2), 495-512.*

16 <u>Zanganeh M., (2021)</u>" Multi-gene GP and GA-FIS Models for Estimating Roughness Coefficient in Erodible Channels", *Journal of Water Science and Technology, Submitted.*

17 <u>Zanganeh M</u> and Chaji A., (2021)" Prediction of Short-term Sea Water Level Fluctuations at the Caspian Sea by an Integrated ApEn and PSO-ANFIS model ", *Journal of China Ocean Engineering, Submitted.*

Book chapters and Conference Papers

- Zanganeh, M., Mousavi, S.J., and Etemad- Shahidi .A (2006), "A Genetic Algorithm-Based Fuzzy Inference System in Prediction of Wave Parameters", Paper No.63, ISBN, 978-3-540-34780-4. Pages 741-750, Springer, Dortmund, Germany, book chapter, Computational Intelligence, Theory and Applications.

- Zanganeh, M. and Yeganeh-Bakhtiyari (2011)" Modeling of flow Pattern around Pipelines via Finite Volume Method". Hydraulic conference, Tehran.

- Zanganeh, M., and Hajmomeni (2011)"A Estimation of Flushing Time on the back of Causeways by MIKE 21 model". Third International Symposium on Environmental and Water Resources Engineering.

- Zanganeh, M., and Arabameri M. (2015) "A Comparison between Alternating Block Method and SCS Method to Extract Design Flood for the Changholeh River Basin in Mehran City, First Conference of Water Industry.

- Zanganeh, M., and Arabameri M. (2016) "Stability Analysis of Underground Dam against Rotation via GeoStudio and its Comparison with Plaxis", 5th international of Geotechnical engineering, Tehran, Milad tower.

Work Experiences and Projects

- **Assistant Professor,** *Golestan University, Faculty of Engineering, 2013-now*
- **Dean of Faculty,** *Golestan University, Faculty of Engineering, 2017-now.*
- **Vice president in education and research,** *Golestan University, Faculty of Engineering, 2016-2017.*
- **Head of Civil Engineering section,** *Golestan University, Faculty of Engineering, 2013-2016.*
- **Consulting Engineer,** *Sazeh Pardazi Iran (SPI) Consulting Engineers, Tehran, Iran, 2011-2013.*
- **Research Assistant**, Comprehensive design of storm water networks in Kordestan province, Deputy Research of Iran University of Technology (IUST), 2004.

- **Research Assistant,** soil mechanic laboratory, in design of the wetland of Kordestan province for natural treatment of waste water, Deputy Research of Iran University of Technology (IUST), 2004.

- **Research Assistant,** Field measurements devices and instructions in marine activities, Deputy Research of Iran University of Technology (IUST), 2005.

- Design of pipelines and pump station as an infrastructure for Ghaleh ghazi desalination, Bandar Abbass, 2009.

- Design of offshore and onshore seawater intakes, Qeshm and Badar abbas desalination, Khajeh Nasir University, 2011.

- Design of causeways and breakwaters in rivers like Humon Lake, Iran, Sistan and Baluchestan province, Ramsar sideway in Mazandaran, 2011-2012.

- Assessment of headland bay erosion under swell condition in Oman Sea, small port design, Iran at Sazeh Pardazi consultants, 2012.

- Design of levees for shore protection, Korand small farm dam, North Consulting Engineering, 2012.

- Design of marine intakes and outfalls in Chabahar bay considering thermal diffusion of Chabar petrochemical complex outfall via MIKE3 and its comparison with MIKE-HD at Sazeh Pardazi consultants, 2012.

- Cohesive sediment modeling in Busher estuary with MIKE-HD-MT and MIKE 3 models at Sazeh Pardazi consultants, 2012.

- Evaluation of sea water renewal time on the back of Ramsar sideway islands considering sea level rise and drop, Sazeh Pardazi consultants, 2012.

- Parshall flume application in field flow measurement, Golestan University, 2016.

- Basic design for Asholadeh tourist causeway considering SWOT analysis, North Consulting Engineers, 2016.

- Design of Bousher Rodeshor open intake by rubber mount breakwater, North Consulting Engineers, 2016.

- Design of skirt breakwater for Boushehr ladies coastal pool (Structural design and Hydrodynamic modeling by MIKE), North Consulting Engineers, 2016.

- Environmental Impact Assessment for Azadshar sand mining project, Golestan, Iran, 2015.

- Shore protection for Siraf historical places via rubber mount breakwater (Structural design and Hydrodynamic modeling by MIKE), 2018.

- Evaluation of bridges damages during 2019 flood at Golestan province, 2019.

- Design of Konarak beach wells to supply freshwater with its deep water outfall. Dezab Consulting Engineers, 2019.

- Evaluation of underground water recharge possibilities in Golestan province aquifer, 2021.

- Ram pump design and installation for deep valleys to convey water to higher elevation at farmlands, Golestan University, 2022.

Numerical Code Developments

- Extending the code of **Sphysics** to model two-phase flow behavior of local scour around pipelines under unidirectional flow condition (Ph.D. Thesis). In this work, the sediment phase is assumed as a non-Newtonian fluid and Navier-Stokes equations are solved for sediment motion as well as fluid motion. (FORTRAN). Also a soft contact borrowed from Distinct Element method (DEM) is used to simulate the sediment contacts. The developed model then applied to estimate scour around pipelines and verified by Mao (1986) conducted experiments.

- Developing a programming code to solve water hammer equations via finite difference method and characteristics method. In addition, the developed numerical model was implemented as PSO objective function to optimize hydropower plants system (MATLAB).

- Developing a programming code to optimize cascade stilling basin via particle swarm optimization (PSO) and Cuckoo Optimization Algorithm (COA).

- Extending the code of **I-SPH** to solve bed-load transport under unidirectional flow condition. In this work, sediment phase is assumed as a non-Newtonian fluid and Navier-Stokes equations are solved for sediment motion as well as fluid motion. (MATLAB).

- Extending the code of **FVM-DEM** to solve local scour around pipelines under unidirectional flow condition. In this work, sediment phase movement is assumed as discrete particle and Navier-Stokes equations are solved for fluid motion. Then these two models were combined in a particle in cell manner and final called as Euler-Lagrange model (**FVM-DEM)** (FORTRAN).

- Extending MATLAB Source code to link fuzzy toolbox to Genetic Algorithms (GAs) toolbox for developing new function estimator model (M.Sc. thesis).

- Unidirectional flow based on Compressible SPH (**C-SPH**) method (FORTRAN).

- Extending the **C-SPH** code for simulating water waves and currents in coastal area. This code includes two kinds of wavemakers (sinusoidal and solitary); various types of Boundary Conditions (repulsive force boundary condition; dynamic boundary condition; and Periodic Boundary Condition); and Sub-Particle Scale (SPS) turbulence model. The code is verified via solving various problems such as: wave breaking; wave run-up; standing waves; and wave overtopping. (FORTRAN).

- Application of the **GPTIPS** code developed based on Genetic Programing (GP) for prediction of hydraulic events.

- Development of combined approximate entropy **(ApEn)** model with ANFIS and ANN to predict sea water fluctuation at the Caspian Sea in MATLAB software.

Technical Reviewer

- Engineering Science and Technology, an International Journal (Elsevier)
- Ain Shams Engineering Journal (Elsevier).
- International Journal of Civil engineering, Iran University of Science and Technology (Springer)
- Journal of Coastal Research (JCR)
- Journal of Hydraulic Engineering *(in Persian).*
- Journal of Civil Engineering, Sharif University (*in Persian*).

Teaching Assistant Experiences

- **Teaching Assistant** in M.Sc. Course: *Introduction to Coastal Engineering*
  Iran University of Science and Technology, 2009-2010.

- **Teaching Assistant** in M.Sc. Course: *Design of Coastal Structures*
  Iran University of Science and Technology, 2009-2010.

- **Teaching Assistant** in the M.Sc. Course: *Open Channel Hydraulics*
  Iran University of Science and Technology, 2006-2009.

Academic Honors

- Ranked **872**th in the university entrance exam ("Nationwide Entrance Exam of State Universities") B.Sc., 1999.

- Ranked **446th** among more than 24000 B.S. participants of "Nationwide Entrance Exam of State Universities" for M.Sc. degree, Iran, 2003.

- Ranked **1**th in the university entrance exam for Ph.D. degree, Iran University of Science and Technology (IUST), 2006.

Membership

- Iranian construction engineering organization in structure (2011-now)
- Member of committee to evaluate damages of spring 2019 flood on infrastructure at Golestan province
- Representative of Golestan University at Iranian Hydraulic Association

Panels and Lectures

- Head of boards at a panel entitled by "Remedies for Gorgan Gulf Saving", Golestan Science and Technology Park, fall 2018.
- Flow measurement courses, North Consulting Engineers, Golestan, fall 2017.

Skills in Computer and Programming

- **Programming Skills:**
  Fully Proficient in: FORTRAN, MATLAB
  Proficient in: C, Python

- **Computer Software:**
  1- **Structural Software:** SAP, SAFE, ETABS, SACS
  2- **Coastal Engineering Software:** MEPBAY, MIKE-21, MIKE-FLOOD, PLAXIS, Geo-Studio, Flow 3D, ALLPILES, DELFT 3D
  3- **Water Engineering Software:** MIKE-SWMM, MODSIM, HEC-HMS, Hammer, WATER CAD, SEWERCAD, MODFLOW, SMADDA, HEC-RAS
  4- **General Software:** AUTOCAD, MATLAB, ARC-GIS, LINGO, TECPLOT, and Microsoft Office Software, LAND , Surfer

Language Proficiency

- **Persian**   Native
- **English**   Almost Fluent
- **Arabic**   High Reading Competence
                         Low Speaking Competence
- **Turkish**   Medium Speaking Competence

Personal Interests

- Music
- Watching Movies
- Playing Soccer
- Mountain Climbing
- Judo

Referees

- **Dr. Abbas Yeganeh Bakhtiari,** Supervisor at my Ph.D. thesis, Hydro-environmental Research Centre, School of Civil Engineering, Iran University of Science and technology, Tehran, Iran,

    Phone: (+98-21) 77240399   Ex: 3130

    Fax: (+98-21) 77240398   Email: Yeganeh @ iust.ac.ir

- **Dr. Amir Etemad Shahidi,** Supervisor in M.Sc. thesis, Griffith University, Australia

    Phone: (+98-21) 77240399   Ex: 3170

    Fax: (+98-21) 7724 0398   Email: Etemad @iust.ac.ir

- **Dr. Mohamad Hadi Afshar,** My Teacher in Iran University of Science and Technology, School of Civil Engineering, Iran University of Science and technology, Tehran, Iran,

  Phone: (+98-21) 77240399   Ex: 8159   Email: mhafshar @ iust.ac.ir