

CV-Farhoud Kalateh

Associate professor in Civil Engineering (Ph.D.)

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EDUCATION

- Ph.D., University of Tehran (2005-2011)
“**Acoustic Cavitation Effects on nonlinear dynamic interaction of concrete Dams-Reservoir**”
- M.Sc., University of Tehran (1997 –1999)
“**Numerical Estimation of three dimensional distribution of Hydrodynamic Pressure in reservoir of Dams**”
- B.Sc., University of Tabriz (1993-1997),
- High School Diploma in Mathematics and Physics, Talegani (Mansour) High School-Tabriz, grad^{1th}

PROFESSIONAL EMPLOYMENT

2001-2011 Regional Water Company of East Azerbaijan- Ministry of Energy Tabriz-Iran
Hydraulic Structures Engineer

As a Hydraulic Structure Engineer, Reviewing and controlling the plans and technical reports provided by the consulting engineering companies regarding with the dam and irrigation network projects in East Azerbaijan province and providing expert opinions in this regards.

2012-Present Omran Takamol Consulting Engineering Co. Tabriz-Iran
Senior Hydraulic Engineering

Implement finite element analysis for evaluating of seismic stability of Earth dams and Rock fill dams.
Perform seismic analysis of liquid storage tanks.
Cooperate in the Design of pipelines and pump stations.
Perform slop stability analysis of earth dams.
Participate in hydraulic and structural design of irrigation networks and relevant hydraulic structures.

Assistant Professor (2011- 2019)
Associate Professor (2019-till now)

- Numerical Computation (Undergraduate)
- Hydraulic (Undergraduate Students)
- System Engineering (Undergraduate)

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- Elementary of Dam Engineering (Undergraduate)
- Earth and Rock fill dams (Graduate,MSc& PhD)
- Finite Element Method (Graduate,MSc& PhD)
- Fluid-Structure Interaction (Graduate,MSc)
- Advanced Hydraulic (Graduate,MSc)

RESEARCH INTEREST

- Computational mechanics (Numerical simulation of different engineering phenomena through Finite Element Method(FEM), Boundary Element method(BEM), Meshless Method (SPH))
- Numerical simulation of Fluid-Structure Interaction
- Numerical Simulation of Cavitating flow
- Assessment of probabilistic performance of nonlinear dynamic response of dams and liquid tanks.
- Blast loading effects on dynamic behavior of dams and liquid tanks
- Optimization of Hydraulic Structure performance in regard of hydraulically and structurally aspects
- Numerical simulation of Liquefied soil behavior.
- Turbulent flow simulation methods (LES, RANS)

HONORS

- Scholarship for PhD. from Ministry of Science, Research and Technology-Iran
- 2th rank out of more than 50 applicants in the PhD entrance exam of University of Tehran (2005)
- Second rank MSc Hydro-structure student in CivilEngineering Department of University of Tehran.(2005)
- 481thrank out of more than 150,000 applicants in the Bachelor generalentrance exam of Iranian universities. (1998)

COMPUTER SKILLS

Programming Languages

- FORTRAN, MATLAB,PYTHON

Professional Software

- Numerical Simulation Software (ANSYS, ABQUS, COMSOL, FLUENT)
- Open source software (OpenFoam, OpenSees)

Graduate PHD Students Supervised

| Year | Name | Title |
|-------------|-------------|---|
| 2024 | A.Bolandi | Thermal effects on the contaminate transport in the deforming porous media: Soil de-pollution |
| 2023 | M.Moradi | Numerical study of the effect of unsteady shear cavity flow on vortex induced vibration of cylinders adjacent of moving bed |

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| 2023 | B.Moshver | Uncertainty in numerical modeling of wave propagation in shallow waters. |
| 2023 | E.Aminvash | Experimental Investigation of the Effect of the Geometry of Inclined Drop Baffles Equipped with Screens on Its Hydraulic Performance |
| 2023 | M.Kheiry (Graduated) | Comprehensive Investigation of Seepage through Earth Dam Under Static and Dynamic Loading by Considering Uncertainty |
| 2021 | M. Nobarinia (Graduated) | Experimental Study on Piping Failure of Earth Dams |
| 2020 | F. Hosseinejad (Graduated) | Fuzzy form of Coupled Analysis of porous media with nonlinear pore fluid flow Subjected to Dynamic loading using Finite Element Method |
| 2019 | A. Koosheh (Graduated) | Numerical simulation of cavitated fluid and structure interaction using hybrid Smoothed Particle Hydrodynamic – Immersed Boundary – Finite Element algorithm |

Graduate MSc Student Supervised

| Year | Name | Title |
|------|--------------------|--|
| 2023 | Y.Azimzadeh | Numerical study of the effects of energy dissipation baffles on channel bed on Hydraulic performance of Sharp-Crested side spillway in the super and sub critical flow |
| 2023 | M.Moastafavipour | Numerical modelling of Nono-fluid flow through porous media: Soil pollution recovery |
| 2023 | M.Golsanamloo | Numerical assessment of the effect of frequency content of earthquakes on seismic damage of concrete gravity dams using cloud nonlinear dynamic analysis |
| 2023 | A.Mokhtari | Numerical simulation and hydrodynamic analysis of unsteady fluid flow in 180 degree bent pipes with stenosis |
| 2023 | A. AmirTaheri | Assessment of retrofitting of reservoir fluid tanks under near and far fault earthquakes using baffles |
| 2022 | A. Fathipour Jahed | Numerical study of the effects of bed slope on hydraulic performance of side spillway in the super and subcritical flow |
| 2021 | P. Asdagi | Numerical Study of impact forces due to floating ice mass on adjacent floating structure with considering of Fluid-Structure interaction |
| 2020 | S. Mousavi | Seismic Damage Assessment of Anchored steel storage tanks through Nonlinear Dynamic analysis |
| 2020 | M. Moharami | Dam Dimension Effects on Seismic Damage Assessment of Concrete Gravity Dams using Incremental Dynamic Analysis |
| 2020 | S. Irani | Seismic Damage Analysis of Earth dams using nonlinear dynamic analysis and Investigation of relation of input records characteristics with Damage Level |
| 2019 | S.F. Ghoddusifar | Optimization of Multipurpose reservoir operation using Stochastic Dynamic Programming |

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| 2019 | H. Hossenizadeh | Investigation of flow pattern and comparison of different shape of Spillways in irregular plan on discharge coefficient |
| 2019 | M. Barati | Numerically investigation of the effects of spur dies series combination with Bandal-like species on flow pattern using FLOW 3D |
| 2019 | R. Aahadifar | Investigation of earth dam material uncertainty on the assessment of overtopping flood characteristics |
| 2018 | M. Sadeghi | Numerical model updating of unsteady flow in open channel networks using response surface and heuristic methods |
| 2018 | S. Afshari | Three dimensional analysis of the Kalgan dam seepage and evaluation of the alluvial roof on the dam foundation sealing using Seep3D |
| 2017 | M. Ebrahimi | Finite Element Analysis of Earth Dam under Explosion Loading |
| 2017 | A. Jafari | Unsteady flow analysis in the open channel network |
| 2016 | Z. Chenaparchi | Evaluation of Seismic response and Sensitivity analysis of Sattarkhan earth dam under 2012 Ahar Earthquake using finite element method |
| 2016 | R. Fani | Dynamic Analysis of Elevated Liquid Storage Tanks under Blast Loading |
| 2016 | S. Asgari | Sensitivity analysis of contaminant Transportation in heterogeneous soil mass using simulation softwares |
| 2016 | H. Lotfollahi | The dam project scheduling optimization using ant colony |
| 2016 | A. Dadi | Estimation of Characteristics of Flood induced from dam break in different arrangement of Urban Pattern |
| 2015 | F. Norouzi | Numerical simulation of underwater explosion (undex) in the reservoir of concrete dam and the study of its effects on dam's stability |
| 2015 | B. Z. Milani | Hydraulically investigation of two phase flow pattern in morning glory Spillway and effect of ventilation position on flow pattern |
| 2014 | G. Seifi | Study the effects of Azerbaijan's recent earthquakes in 2012 on the stability of Starkhan Earth Dam using instrumentation results and comparison with the results of numerical model dam |
| 2014 | R. Solatabadi | Numerical simulation of flow pattern in the inverted siphon and culverts using FLUENT |
| 2014 | B. Alipour | Investigation of flow pattern in the stilling basin of bottom outlet using FLOW 3D(case study: Khoda Afarin dam) |
| 2014 | M. J. Malekabadi | Accurate estimation of water surface profile in gradually varied flow by adaptive methods and comparison with common methods |
| 2014 | S. Aslzad | Evaluation of Liquefaction potential region of earth dam during earthquake (Case Study: Golfaraj dam) |

PUBLICATIONS

International Journals (In English):

Kalateh F., Fani K. R., On the Effects of Frequency Content on Seismic Response of Anchored Liquid Storage Tanks, Submitted to Journal of Structural Engineering, (Under review).

Kalateh F., Aminvash E., Daneshfaraz, R., On the hydraulic performance of the inclined drops: the effect of downstream macro-roughness elements., AQUA — Water Infrastructure, Ecosystems and Society Vol 00 No 0, 1 [DOI: 10.2166/aqua.2024.304](https://doi.org/10.2166/aqua.2024.304), 2024.

Kalateh F., Aminvash E., Abraham J., On the Effect of Froude Number and Slope of the Channel Bed on the Hydraulic Performance of the Sharp-Crested Rectangular Side Weir: A Numerical Modeling, Submitted to European Journal of Environmental and Civil Engineering, [DOI: 10.1080/19648189.2024.2314112](https://doi.org/10.1080/19648189.2024.2314112), 2024.

Kalateh F., Ghamatloo, A., Kheiry M., Assessment of sediment effect on seismic damage of concrete gravity dam through nonlinear incremental dynamic analysis, Journal of Iranian Journal of Science and Technology Transactions of Civil Engineering, (Accepted).

Kalateh F., Kheiry M., A Review of Stochastic Analysis of the Seepage Through Earth Dams with a Focus on the Application of Monte Carlo Simulation, Archives of Computational Methods in Engineering <https://doi.org/10.1007/s11831-023-09972-3>, 2023.

Kalateh F., Hosseinzadeh S., Kheiry M., Uncertainty quantification in the analysis of liquefied soil response through Fuzzy Finite Element method, Acta Geodyn. Geomater., Vol. 19, No. 3 (207), 177–199, 2022, DOI: 10.13168/AGG.2022.0007

Kalateh F., Hosseinzadeh S., Koosheh A., Analysis and application of the modified smoothed particle hydrodynamics method to simulate cavitating flow, Journal of the Brazilian Society of Mechanical Sciences and Engineering, Doi: 10.1007/s40430-021-03205-z, 2021.

Seifollahi, M., Lotfollahi-Yaghin, M.A., Kalateh, F., Daneshfaraz, R., Abbasi, S., Abraham, J. P., Estimation of the Local Scour from a Cylindrical Bridge Pier Using a Compilation Wavelet Model and Artificial Neural Network, J. Hydraul. Struct., 2021; 7(3):1-22 DOI: 10.22055/jhs.2021.38300.1187.

Kalateh, F., Irani, S., Investigate probability of damage of Earth dam under Near-field and Far –field earthquake: Case study Gotvand earth dam, Dam and Hydroelectric Powerplant. 8 (28) :52-39, 2021.

Nobarinia M., Kalateh F., Nourani V., Babaeian A., Dam failure peak outflow prediction through GEP-SVM meta models and uncertainty analysis, Water Supply, Doi: 10.2166/ws.2021.100, 2021.

Khoshghalb A., Nobarinia M., Stockton J., Kalateh F., On the effect of compaction on the progression of concentrated leaks in cohesive soils, Acta Geotechnica, Doi: 10.1007/s11440-020-01029-0, 2020.

Kalateh, F., Koosheh A., Simulation of cavitating fluid–Structure interaction using SPH–FE method, Mathematics and Computers in Simulation, 173,51-70, Doi: 10.1016/j.matcom.2020.01.019, 2020.

Kalateh, F., Saberi, M., Numerical Investigation of dip angle direction of foundation Joint on nonlinear dynamic response of concrete gravity dams, Dam and Hydroelectric Powerplant. 2020; 7 (24) :89-74.

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Kalateh F., Hosseinejad F., Uncertainty assessment in hydro-mechanical-coupled analysis of saturated porous medium applying fuzzy finite element method, *Frontiers of Structural and Civil Engineering*, Doi: 10.1007/s11709-019-0601-z, 2020.

Kalateh, F, Ghamatloo, A., Investigation of Uplift force effects on Seismic Damage of Concrete Gravity Dam in the Near-Fault and Far-Fault Ground Motions:Case Study Shafaroud Dam, *Journal of Structural and Construction Engineering(JSCE)*, 2019, Doi: [10.22065/JSCE.2017.93011.1271](https://doi.org/10.22065/JSCE.2017.93011.1271).

Hosseinejad F., Kalateh F., Mojtahedi A., Numerical Investigation of liquefaction in earth dams: A Comparison of Darcy and Non-Darcy flow models, *Computers and Geotechnics*, Doi:10.1016/j.compgeo.2019.103182, 2019.

Kalateh, F., A Finite Volume Formulation of Hydrodynamic Pressure in DamReservoir Systems with non-uniform reservoir geometry, *MCEJ*. 2018; 18 (3) :181-194,URL: <http://mcej.modares.ac.ir/article-16-20130-fa.html>

Kalateh F., Koosheh A., Finite element analysis of flexible structure and cavitating nonlinear acoustic fluid interaction under shock wave loading. *International journal of Nonlinear Sciences and Numerical simulation*, Doi:10.1515/ijnsns-2016-0135,2018.

Kalateh, F., Koosheh A., Application of SPH-FE method for fluid-structure interaction using immersed boundary method, *Engineering Computations*, Vol. 35 No. 8, pp. 2802-2824. Doi: 10.1108/EC-01-2018-0041,2018.

Kalateh F., Dynamic Failure Analysis of Concrete Dams under Air Blast using coupled Euler-Lagrange Finite Element method. *Frontiers of Structural and Civil Engineering*, Doi:10.1007/s11709-018-0465-7, 2017.

Jahandar Malekabadi M., Kalateh F., Gradually varied flow profile based on adaptive pattern., *ISH Journal of Hydraulic Engineering*, DOI: 10.1080/09715010.2017.1408035, 2017.

Kalateh, F, Dadi, A. ,Evaluation of Characteristics of flood arise from dam-break in urban area under different height of water in the reservoir, 3rd International conference on New Research Achievements in Civil Engineering, Architectural and Urban Management, Iran, Tehran,2016.

Kalateh, F., Koosheh A., Comparing loose and strong finite element partitioned coupling methods of acoustic fluid-structure interaction: concrete dam-reservoir system, *KSCE-civil engineering journal*, Doi:10.1007/SI2205-016-0276-0, 2016.

Kalateh F., Simulation of Cavitating Nonlinear Acoustic Fluid and Flexible Structure Interaction, *The Ninth International Conference on Engineering Computational Technology(ECT2014)*

Kalateh, F., "Safety Analysis of Zayandehriud Arch Dam" *Proceedings, International Conference on Hydraulic Structures, Kerman*, pp. 1205-1216(in Persian), 2001.

Kalateh, F. "Performance Study of monitoring in the Arasbaran Earth Dam", *Proceedings, 7th, International Congress on Civil Engineering, Tarbiat Modares University, Tehran, Iran ,8-10 May 2006(in Persian)*

Kalateh, F., Attarnejad, R. "Application of Computational Mechanics in the studying of Soil-Structure and Fluid-Structure Interaction", *5th International Conference on Seismology and Earthquake Engineering, Tehran-Iran, 2007.*

Kalateh F., Attarnejad R., Nonlinear Dam-Reservoir Dynamic Interaction Analysis arising from Acoustic Cavitation, *Proceedings in the Seventh International Conference on Engineering Computational Technology(ECT2011)*, Civil-Comp Press, Stirlingshire, UK, 2010, doi: 10.4203/ccp.94.161.

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Kalateh F., Attarnejad R. , Finite element simulation of acoustic cavitation in the reservoir and effects on dynamic response of concrete dams, Journal of Finite elements in Design and Analysis, Vol. 47, pp: 543-558, (2011). doi:10.1016/j.finel.2010.12.004.

Kalateh F., Attarnejad R., A New Cavitation Simulation Method: Dam-Reservoir Systems, International Journal for Computational Methods in Engineering and Science, Vol. 13, pp:161-183,(2012), doi: 10.1080/15502287.2012.660232

Kalateh F., Finite Element Partitioned Solution Methods for Acoustic Fluid-Structure Interaction Problems, Submitted to Advances in Engineering Software, under review, (2012).

Translated & Published Books

- Translated in Persian book with title "Finite element analysis in geotechnical engineering, Potts, David M & Zdravković, Lidija", Published with Frozesh Publisher, in 2015.
- Published in Persian book with title "Numerical and Physical Modeling in Coastal Engineering", Published with University of Tabriz Publishing Center, in 2020.

REVIEWER

- Act Geotechnica
- International Journal of Coastal and Offshore Engineering
- Journal of Structural Engineering
- Ocean Engineering
- Powder Technology
- KSCE Journal of Civil Engineering
- Engineering and Computational Mechanics
- The Brazilian Society of Mechanical Sciences and Engineering (BMSE)
- Earthquake Engineering and Engineering Vibration
- International Journal of Nonlinear Sciences and Numerical Simulation
- Journal of Earthquake Engineering
- Journal of Ocean Engineering and Science
- Journal of Civil and Environmental Engineering (University of Tabriz Press)
- International Journal of Modeling, Simulation, and Scientific Computing
- Iranian Journal of Science and Technology, Transactions of Civil Engineering
- Water supply