

Dr. Ismail ALBAYRAK (Dr. ès. sc., Ph.D.)

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Google Scholar ID:

<https://scholar.google.com/citations?hl=en&user=2xlJxYgAAAAJ>

Google Scholar *h*-index: 22 & i10-index: 39

Researchgate.net *h*-index: 20

Scopus *h*-index: 18

Publications and presentations are listed on this [link](#).

Research Interests

Dr. Ismail Albayrak is a Senior Scientist and Lecturer at VAW, ETH Zurich. He has published more than 100 papers in peer- and non-peer-reviewed journals, conference proceedings, monograph and books. His principal research interests comprise various topics of Hydraulic Engineering and Research, Eco-hydraulics, Etho-hydraulics, Fluid Mechanics, Environmental Fluid Mechanics, River and Lake Limnology, and Biomechanics with particular focus on:

- Upstream and downstream fish migrations
- Hydro-abrasion at hydraulic structures, sediment bypass tunnels and turbines
- Reservoir sedimentation and management
- Suspended sediment and bed load transports in open channel flows
- Turbulent open-channel flows
- Hydraulic structures
- Hydraulic instrumentation and measurement techniques (ADV, ADVP, ADCP, large & small scale PIV, stereoscopic and panoramic PIV, high-speed imaging, PTV, drag force measurement techniques, geophones, LISST, turbidimeters, Coriolis flow and densitometer)

Education

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|-------------|---|
| 2003 - 2008 | <p>Ph.D. in Environmental Hydraulics
 Laboratory of Environmental Hydraulics (LHE), Swiss Federal Institute of Technology Lausanne (EPFL), Switzerland
 Dissertation:
 ‘An experimental study of coherent structures, secondary flows and surface boils and their interrelation in open-channel flow’
 Committee:
 Prof. Dr. Ulrich Lemmin (supervisor of the thesis), Prof. Dr. Anton Schleiss (president of the jury), Prof. Dr. Emil Hoppfinger , Prof. Dr. Marc Parlange, Dr. David Hurther, Prof. Dr. Nezu Iehisa (expertise report)</p> |
| 2000 - 2003 | <p>M.Sc. in Hydraulic Engineering
 Laboratory of Hydraulic Engineering in the Department of Civil Engineering, Istanbul Technical University, Turkey (including one-year English preparatory course)</p> |

Dissertation:

'Suction removal of non-uniform sediment particles under an armor layer'

Committee:

Prof. Dr. Sevket Cokgor (supervisor of the thesis), Prof. Dr. Mehmet Emin Karahan

1996-2000

B.Sc. in Civil Engineering

Department of Civil Engineering, Istanbul Technical University, Turkey.

Work history

01.01.2020 –
present

Senior Scientist & Lecturer at

Hydraulic Engineering Division, Laboratory of Hydraulics, Hydrology and Glaciology (VAW) at ETH Zurich, Switzerland

01.10.2019 –
31.12.2019

Research Associate (Wissenschaftlicher Mitarbeiter) at

Swiss Federal Institute for Forest, Snow and Landscape Research (Eidg. Forschungsanstalt WSL), Birmensdorf, Switzerland

& Guest Scientist at

Hydraulic Engineering Division, Laboratory of Hydraulics, Hydrology and Glaciology (VAW) at ETH Zurich, Switzerland

01.09.2011 –
30.09.2019

Senior Scientific Assistant, & Lecturer (Oberassistent I & Lehrauftrag) at

Hydraulic Engineering Division, Laboratory of Hydraulics, Hydrology and Glaciology (VAW) at ETH Zurich, Switzerland

2008 - 2011

Research fellow at

School of Engineering, University of Aberdeen, Scotland, UK

2003 - 2008

Researcher and teaching assistant at

Environmental Hydraulics Laboratory (LHE) at Swiss Federal Institute of Technology Lausanne (EPFL), Switzerland

2001 - 2003

Researcher and teaching assistant at

Civil Engineering Department of Istanbul University, Istanbul, Turkey

Institutional responsibilities

2019 - present

Supervision of Ph.D. and M.Sc. students, lecturing, project development and management, and administration

Skills & Certifications

Teaching, Project management leadership skills, Computer & Informatics, Technical/Scientific skills, Organizational skills, Social, communication & teamwork skills, English (advanced), French (B2 level) and German (B1 level) languages.

Previous and on-going research projects

- ABSYS (2022 - present), FishPath (2021 - present)
- Various laboratory and field studies on downstream fish migration, sediment transport and fish habitat in the scope of Fishfriendly Innovative Technologies for Hydropower (FIThydro) project (Horizon 2020 – the EU Framework Programme for Research and Innovation) (2016 - 2021)
- Various projects funded by Swiss Federal Office of Energy (SFOE), Swiss Federal Office for Environment (FOEN), Swiss Commission for Technology and Innovation (CTI) (on-going)
- Hydro-Abrasion at hydraulic structures and steep bedrock rivers (SNF PhD project, completed in 2021)
- Adequate sediment handling at high-head hydropower plants to increase scheme efficiency (SNF PhD project, completed in 2017)
- Potential for future hydropower plants in Switzerland: A systematic analysis in the periglacial environment (PHP) (SNF PhD project, completed in 2018)
- Optimizing hydroabrasive-resistant materials at sediment bypass tunnels and hydraulic structures (PhD project, completed in 2017)
- Field investigation on suspended sediment, hydro-abrasive erosion and efficiency changes of coated pelton turbines (PhD project, completed in 2016)
- Measures to facilitate safe downstream fish migration at large Central-European rivers (PhD project, completed in 2015)
- Layout and design of sediment bypass tunnels (PhD project, completed in 2014)

Consultancy projects

- A diversion tunnel design in SITE C project, Canada (2013)
- Sediment sluicing tunnel project of Nanhua Reservoir, Taiwan (2014)
- Mud Mountain Dam 9-foot tunnel re-armoring: Abrasion calculation and recommendations on the invert lining concept, USA (2016).
- Hydro-abrasion assessment for sediment bypass tunnel of Patrind hydropower project, Pakistan (2016)

Collaborations with research institutes and industry sector

- Norwegian Institute for Nature Research (NINA, FishPath)
- Technical University of Lisbon, Portugal: fish migration project (FIThydro)
- Institut P', CNRS- Université de Poitiers, France : fish migration project (FIThydro)
- Technical University of Tulin, Estonia: fish migration project (FIThydro)
- Norwegian University of Science and Technology, Norway: fish migration and sediment transport (FIThydro)
- Norwegian Institute for Nature Research (NINA), Norway: fish migration and sediment transport (FIThydro & HydroCen)
- Foundation for Scientific and Industrial Research at the Norwegian Institute of Technology (SINTEF), Norway: fish migration and sediment research (FIThydro & HydroCen)
- GFZ German Research Centre for Geosciences, Helmholtz Centre Potsdam: Hydro-Abrasion at Hydraulic Structures and Steep Bedrock Rivers
- Disaster Prevention Research Institute, Kyoto University, Japan: Reservoir sedimentation and sediment bypass tunnels
- TU-Dresden: Hydro-abrasion in sediment bypass tunnels and hydraulic structures

- Hochschule Lucerne, Competence Center for Fluidmechanics and Hydro Machinery: Visualization of wear on Pelton turbines, measurements of Turbine efficiency, suspended sediment load measurements using acoustics.
- TFB AG – Technische Forschung und Beratung für Zement und Beton: Expertise and Tests on high performance and other type of concretes, basalts and tunnel invert materials.
- Structural Maintenance and Safety Laboratory, EPFL: Hydro-abrasion in sediment bypass tunnels and hydraulic structures
- EAWAG (Swiss Federal Institute of Aquatic Science and Technology): Downstream fish migration project: Live-fish experiments.
- Utah State University: Downstream fish migration project: Hydraulics of fish guidance structures.
- University of Aberdeen: Biophysics of flow-plant interactions in aquatic systems
- Collaborations with Industry partners in various projects: BKW AG, Limmatkraftwerke AG, AF-Consult, Peter Fish Consulting, OFIMA AG, Axpo AG, SBB, ewz, Gommerkraftwerke AG, Ouvre Electrica Susassca Susch AG.

Supervision and co-supervision of junior researchers and postdocs

- Yuhao Yan (2024- present), Kamal Prasad Pandey (2023 - present)
- Anita Roth, PhD student (2019 – present)
- Gabor Süss (2022) Viviane Hoffmann, Markus Lang (2022), Roland Hagenbüchli (2019), M.Sc. students
- Dila Demiral, PhD student (2017 - 2021), Claudia Beck, PhD student (2017- 2020)
- Michelle Müller-Hagmann, former PhD student (2011-2017)
- David Felix, former PhD student (2011 - 2016), current Postdoc (2016 - 2022)
- Carl Robert Kriewitz-Byun, former PhD student (2011-2015)
- Christian Auel, former Ph.D. student (2011 - 2014)
- Aischa Gudde, former M.Sc. student (2016)
- Fiona Mager, former M.Sc. student (2016)
- Giacomo Moretti, former M.Sc. student (2014)
- Claude Pahud, former M.Sc. student (2013)
- Many Bachelor students and VAW staff in various projects
- Jury member of internal and external PhD students

Teaching activities

2017 – present	<p>Physical Modelling in Hydraulics (Wissenschaftliche Arbeitsmethoden)</p> <p>Main lecturer together with Dr. Benjamin Hohermuth (2017 - present) Received 4.4/5.0 (2017), 4.3/5.0 (2019), 4.8/5.0 (2021) average rating for teaching effectiveness from student evaluations.</p> <p>Physical Modelling in Hydraulics (Wissenschaftliche Arbeitsmethoden)</p>
2014 – 2016	Second lecturer with Prof. Willi Hager

2013 – 2018	<p>Selected Topics on Hydraulic Engineering (Ausgewählte Kapitel aus dem Wasserbau)</p> <p>Second lecturer with Prof. Robert Boes (2013 - 2017) and giving one lecture per semester (2018)</p>
2016 - present	<p>Hydraulics of Engineering Structures</p> <p>Main lecturer with Dr. Frederic Evers (2017 – present)</p>

Active membership and scientific reviewing activities

- Member of International Association of Hydro-Environment Engineering and Research (IAHR)
- Reviewer for: Journal of Hydraulic Engineering (ASCE), Water Resources Research (AGU), Journal of Ecohydraulics, Ecological Engineering, Ecohydrology, Flow Measurement and Instrumentation

Organization of conferences and workshops

- Scientific committee of 13rd International Symposium on Ecohydraulics, Nyon, France, 23-29 May, 2020.
- Scientific committee of 3rd International Workshop on Sediment Bypass Tunnels, Taipei, Taiwan, 9-12 April, 2019.
- Scientific committee of 38th IAHR world Congress, Panama city, Panama, 1-6 September, 2019.
- Organization of workshop on fish protection and downstream fish migration at hydroelectric power plants - new research approaches (VAW & Wasser Agenda 21), Zurich, Switzerland, 3 June, 2019.
- Organization of 4rd General Assembly of FIThydro, Trondheim, Norway, 24-27 June, 2019.
- Organization of a mini-workshop on Sediment Management at Hydropower Plants & Dams (VAW & HydroSediNet organized by World Bank), Zurich, Switzerland, 17 May, 2019.
- Organization of a workshop on fish passage, Safepass - FIThydro, Zurich, Switzerland, 18-19 March, 2019.
- Organization of a workshop on laboratory and field measurement techniques and numerical simulation, FIThydro, Lisbon, Portugal, 25 January, 2019.
- Organization of 5th Case Study Management Board meeting, FIThydro, Lisbon, Portugal, 23-24 January, 2019.
- Organization of Alpine stakeholder workshop on fish-friendly hydropower, Augsburg, Germany, 10-11 September, 2018.
- Organization of 3rd General Assembly of FIThydro, Zurich, Switzerland, 25-27 June, 2018.
- Organization of 2rd General Assembly of FIThydro, Poitier, France, 6-9 November, 2017.
- Organization of workshop titled 'Dealing with hydro-abrasive erosion at high-head HPPs' in 28th IAHR-Symposium on Hydraulic Machinery and Systems, Grenoble, France, 4-8 July 2016.
- Organization of 1st international workshop on Sediment Bypass Tunnels, ETH Zurich, Zurich, Switzerland, in 27-29 April, 2015.

Committees

- Member of International Association for Hydro-environment Engineering and Research (IAHR) working group on reservoir sedimentation
- Steering Committee member of FITHydro.
- Steering Committee member of International Network in Sediment Management for Hydropower & Dams (HydroSediNet, a World Bank's project).

Invited talks

- Workshop on sediment bypass tunnels and fish passage, Trondheim, Norway, 12-13 February, 2019
- Water agenda 21, workshop on fish passage, Bern, Switzerland, 1st June, 2017.
- Workshop on fish passage and migration, Istanbul, Turkey, 21-22 November, 2016.
- Workshop on fish passage at hydropower plants, Rize, Turkey, 31st July, 2015.
- Open sediment workshop, Tiran, Albania, 12-13 October, 2015.

Fellowship & awards

- 2008-2011 Research fellow at University of Aberdeen, Scotland, UK
- 2007 2nd Prize in J.F. Kennedy Student Paper Competition at 32. IAHR Congress, Venice, Italy.

Publications and presentations

Peer-reviewed papers including working papers (30)

Non peer-reviewed national/international papers (15)

Monographs & Book Contributions (19)

Conference papers (75)

Total number of 139 publications and 56 presentations.