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Curriculum Vitae Marios Karaoulis
Senior consultant / data scientist

Personal details

Name	**Marios Karaoulis**
Function	Sr. consultant/ data scientist
E-mail	Marios.Karaoulis@gmail.com
Phone	+31 (0) 621286149
Nationality	Greek
Date of birth	16-10-1979
Country of Residence	The Netherlands

Expertise

Data science   **Development of AI methods for data fusion (data analysis)**
Development of visualization toolkit   **Drone-based sensors hardware development with Arduino**   **Lab validation experiments**   **Big Data management**

Key responsibilities

- Leader of data science group for subsurface information (digital transformation)
- Development of simulation algorithms for various geo-physical models.
- Design of lab tests to validate physical models.
- Machine learning for data driven modeling. Let data tell their own story.

Employment

Sr. Advisor,
Jan 2014 - Today
Deltares, Netherlands.

List of some relevant data analysis, experimental lab design and validation recent projects:

- Study on Negligible Dedicated Equipment on Rovers for Soil Testing and Appraisal of Navigable fields (UNDERSTAND). Project for the European Space Agency to risk assessment of the soil terrain, using rover built-in sensors. Data analyse of sensors, predicative algorithm and validation in lab environment. Python + Matlab code.
- Project leader and principal investigator for drone monitoring development. Arduino code to GPS, LiDAR, Electromagnetic Sensors and drone flight control. Data collections and analysis using python. Development of AI code for data fusion using python (TensorFlow).
- Kennisimpuls Nutrienten: Real-time detection and prediction of nitrate leaching and contamination of the water resources from farms. Design of experiment setup, hardware implementation, data collection and data analysis. Transform data to real-time information for stakeholders. Python and VTK toolkit.
- WarmingUP: Accelerating the Dutch energy transition. The main goal of WarmingUP is the development of collective heating systems that are affordable, sustainable, reliable, practicable and socially acceptable. Design of lab test to validate the data collection, hardware implementation for data collections, data analysis. Transform data to information for stakeholders. Matlab and python based code developed.
- DigiTwin PPS: The DigiTwin project for Flood Defence and Subsurface aims to provide a 'framework' for the development of a Digital Twin for Flood Defences and Subsurface and the application of data fusion methods, using machine learning and AI. Development of code for data analysis (data fusion) using python (TensorFlow).
- Big data processing and visualization: Machine Learning on big data. Statistical analysis and developing of data framework using AI. Developing python code to be used for in-house projects. Several projects. Machine learning paper under publication. Code in https://bitbucket.org/DeltaresGEO/fancyfusion/src/master/
- IPI4DI: Matlab software development for 4D analysis of geophysics data (https://doi.org/10.1016/j.cageo.2013.01.008)

Other key duties:

- Part of a team exploring opportunities in working with start-up companies

Associate geophysicist
Aug 2013-Dec 2013
Illinois State Geological Survey, USA

- Groundwater data management. Application in agriculture for the optimization of crops
- Detection of leakage.

Research Fellow
Apr 2010- July 2013
Environmental Protection Agency (EPA), USA

- Developing algorithms for time series analysis of geophysical data, for environmental applications. Data fusion of heterogeneous data.
- Water quality and waste management using geophysics. Key applications:
    - Nitrate contamination leaking in Tennessee. Data analysis.
    - Water quality risk assessment (multiple projects)

Geologist
Jan 2009- Jan 2010
Prefecture of Evros, Greece

- Geological services – road construction, drilling supervising, water quality monitoring
- Digital mapping with ArcGIS

Geophysicist
Mar 2008 – Jan 2010
Geomorph instruments

- Geophysical services
- Training seminars

Cartographer at Navteq
Dec 2008

- Digital mapping with GIS

Education

2006 - 2009	Ph.D - Aristotle University of Thessaloniki - Geophysics
2003 - 2006	MSc - Aristotle University of Thessaloniki - Geophysics
1998 - 2003	BSc - Aristotle University of Thessaloniki - Geology

Teaching Experience

2014-2021	Advising PhD, MsC and Interns, on risk assessment for the environment.
2010-2013	TA and associate professor at Colorado school of Mines, Department of Geophysics
2006-2008	Teaching assistant at Aristotle University of Thessaloniki

Languages

	Writing	**Speaking**	**Reading**
Dutch	Basic	Basic	Good
English	Excellent	Excellent	Excellent
Greek	Mother tongue	Mother tongue	Mother tongue
Italian	Basic	Basic	Basic

Publications

Citations: 1856, h-index: 26, i10-index: 33.
https://scholar.google.nl/citations?user=Q_K_Kp4AAAAJ&hl=en&oi=ao

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Papers
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Huizer, S., M. C. Karaoulis, G. H. P. Oude Essink, and M. F. P. Bierkens. "Monitoring and Simulation of Salinity Changes in Response to Tide and Storm Surges in a Sandy Coastal Aquifer System." *Water Resources Research* 53, no. 8 (2017): 6487–6509. https://doi.org/10.1002/2016WR020339.
Ikard, S. J., A. Revil, M. Schmutz, M. Karaoulis, A. Jardani, and M. Mooney. "Characterization of Focused Seepage Through an Earthfill Dam Using Geoelectrical Methods." *Groundwater* 52, no. 6 (2014): 952–65. https://doi.org/10.1111/gwat.12151.
Karaoulis, M. C., J.-H. Kim, and P. I. Tsourlos. "4D Active Time Constrained Resistivity Inversion." *Journal of Applied Geophysics* 73, no. 1 (2011): 25–34. https://doi.org/10.1016/j.jappgeo.2010.11.002.
Karaoulis, M., A. Revil, and D. Mao. "Localization of a Coal Seam Fire Using Combined Self-Potential and Resistivity Data." *International Journal of Coal Geology* 128–129 (2014): 109–18. https://doi.org/10.1016/j.coal.2014.04.011.

Karaoulis, M., A. Revil, B. Minsley, M. Todesco, J. Zhang, and D.D. Werkema. "Time-Lapse Gravity Inversion with an Active Time Constraint." *Geophysical Journal International* 196, no. 2 (November 2013): 748–59. https://doi.org/10.1093/gji/ggt408.

Karaoulis, M., A. Revil, P. Tsourlos, D. D. Werkema, and B. J. Minsley. "IP4DI: A Software for Time-Lapse 2D/3D DC-Resistivity and Induced Polarization Tomography." *Computers & Geosciences* 54 (2013): 164–70. https://doi.org/10.1016/j.cageo.2013.01.008.

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Conferences

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