

CURRICULUM VITAE – VLADIMIR V. KAZEI

PERSONAL INFORMATION

Vladimir V. Kazei

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I always liked to solve tricky mathematical problems and first participated in a Mathematical Olympiad when I was ten. I enjoyed participation in mathematical competitions, getting several diplomas at high school and university for achievements.

Mathematical Physics, which was my BSc major, were taking me too far away from real problems and then I discovered geophysics. Geophysics is great as it allows me to apply my mathematical skills to real-world problems.

RESEARCH INTERESTS Geophysics; inverse problems, deep learning, full waveform inversion; seismic modeling and inversion for anisotropy; edge-preserving regularization methods; inversion for low spatial wavenumbers in a model.

EDUCATION

PhD in Geophysics, The Schmidt Institute of Physics of the Earth of the Russian Academy of Sciences (IPE RAS) / Saint Petersburg State University (2012-2016). Thesis advisor: Boris M. Kashtan (SPSU, Faculty of Physics, Earth's Physics Department). Thesis title: *Pseudo-spectral full-waveform inversion in acoustic media*.

Master of Sciences in physics with distinction from Saint Petersburg State University (2009-2012). Thesis advisor: Boris M. Kashtan (SPSU, Faculty of Physics, Earth's Physics Department). Thesis title: *Investigation of possibility to use head waves for inhomogeneity reconstruction in acoustic media*.

Bachelor of Sciences in physics with distinction from Saint Petersburg State University (2005-2009). Thesis advisor: Nikolay D. Filonov (SPSU, Faculty of Physics, Department of Mathematical Physics). Thesis title: *Investigation of zero set of the Fourier transform of a 2D characteristic function*.

Saint Petersburg Lyceum 533 (2003-2005) High school. Mathematical class.

EXPERIENCE	<p>2016 → Post Doctorate Researcher at King Abdullah University of Science and Technology, Seismic Wave Analysis Group (SWAG), Physical Sciences and Engineering Department (PSE) Research on anisotropic elastic waveform inversion, regularizations and machine learning. I closely collaborate with and help supervise PhD students Mahesh Kalita (regularizations for salt inversion) and Oleg Ovcharenko (machine learning for seismic inversion). Apart from doing research and writing papers I work on project proposals to acquire additional funding for the seismic wave analysis group lead by Prof. Tariq Alkhalifah.</p> <p>2010 → 2016 Engineer-researcher (geophysicist) at Saint Petersburg State University, Faculty of Physics, Earth's Physics Department, Laboratory of Elastic Media Dynamics Mathematical derivations and scientific programming for geophysical problems. Seismic data modeling and processing. Involved into a project: "Full-waveform inversion" sponsored by Shell Global Solutions International B.V. since 2011.</p> <p>2013 → Visiting-researcher (geophysicist) at University of Hamburg, Institute of Geophysics, Chair of Applied Seismics Development of "Pseudo-spectral seismic waveform inversion" codes.</p> <p>2014, October Visiting-researcher (geophysicist) at Colorado School of Mines, Department of Geophysics, Center for Wave Phenomena Short stay to collaborate with Prof. Paul Sava on development of extended images applications to full-waveform inversion.</p> <p>2015, March-April Visiting-researcher (geophysicist) at KAUST, Department of Earth Science and Engineering, Seismic Wave Analysis Group (SWAG)</p>
SOFT SKILLS	Matlab, C, Python, Linux (Debian, CentOS), Microsoft Office, bash and tcsh, L ^A T _E X 2 _ε , Madagascar, Tensorflow, Keras
PROFESSIONAL AFFILIATION	Society of Exploration Geophysicists (SEG), European Association of Geoscientists and Engineers (EAGE), American Geophysical Union (AGU).
LANGUAGE SKILLS	Russian: Mother tongue; English: Fluent; German: Basic.
HONORS & AWARDS	<ul style="list-style-type: none"> • Winner of Olympiads in Mathematics and Physics (St.Petersburg 2003-2005) • BSc in Mathematical Physics with honors 2009 • MSc in Geophysics with honors 2012 • Grant award for excellence in geoscience of Government of St.Petersburg • SEG student scholarship award 2015 • 1st place in KAUST GPU Hackathon 2017, 2018
HOBBIES	windsurfing, water polo, swimming

PUBLICATIONS

- Vladimir Kazei, Tariq Alkhalifah; Scattering Radiation Pattern Atlas: What medium properties can we resolve using anisotropic elastic full-waveform inversion?, *Journal of Geophysical Research: Solid Earth*, 2018, in revision
- Mahesh Kalita, Vladimir Kazei, Yunseok Choi, Tariq Alkhalifah, 2018: Full waveform inversion with automated salt-flooding, *Geophysics*, revision submitted
- Vladimir Kazei, Tariq Alkhalifah; Waveform inversion for orthorhombic anisotropy with P waves: feasibility and resolution, *Geophysical Journal International*, Volume 213, Issue 2, 1 May 2018, Pages 963-982, <https://doi.org/10.1093/gji/ggy034>.
- Oleg Ovcharenko, Vladimir Kazei, Daniel Peter, and Tariq Alkhalifah (2018). Variance-based model interpolation for improved full-waveform inversion in the presence of salt bodies. *GEOPHYSICS*, 83(5), R541-R551, <https://doi.org/10.1190/geo2017-0575.1>
- Vladimir Kazei, Boris Kashtan, Vladimir Troyan and Ekkehart Tessmer, Pseudo-spectral full-waveform inversion, *Seismic Technology*, 2015 (2), pages 18-28.
- Denis Anikiev, Vladimir Kazei, Boris Kashtan, Andrey Ponomarenko, Vladimir Troyan, Renat Shigapov, *Methods of seismic waveform inversion*, *Seismic Technology*, 2014, 12(1), pages: 38-58.
- Vladimir Kazei, Boris Kashtan, Vladimir Troyan and Wim Mulder, On the role of reflections, refractions and diving waves in full waveform inversion // *Geophysical Prospecting*, 2013, 61(6), pages: 1252-1263, doi:10.1111/1365-2478.12064.

Expanded abstracts:

- Vladimir Kazei, Tariq Alkhalifah; Time-lapse waveform inversion regularized by spectral constraints and Sobolev space norm SEG Technical Program Expanded Abstracts 2018, 5487-5491
- Mahesh Kalita, Vladimir Kazei, Yunseok Choi, Tariq Alkhalifah, Regularized full-waveform inversion for salt bodies SEG Technical Program Expanded Abstracts 2018, 1043-1047
- Oleg Ovcharenko, Vladimir Kazei, Daniel Peter, and Tariq Alkhalifah Variance-based model interpolation for improved full-waveform inversion in the presence of salt bodies *Geophysics* 83 (5), 1-60
- Oleg Ovcharenko, Vladimir Kazei, Daniel Peter, Xianliang Zhang and Tariq Alkhalifah Low-Frequency Data Extrapolation Using a Feed-Forward ANN 80th EAGE Conference and Exhibition 2018
- Mahesh Kalita, Vladimir Kazei, Yunseok Choi, Tariq Alkhalifah, Full-Waveform Inversion for Automated Salt Flooding 80th EAGE Conference and Exhibition 2018
- Vladimir Kazei, Tariq Alkhalifah; Resolving Orthorhombic Anisotropy with the Addition of PS Conversions 80th EAGE Conference and Exhibition 2018
- Vladimir Kazei, Masmoudi, N., Oh, J. W., Tzivanakis, C., & Tariq Alkhalifah, T. (2017). From CPU to GPU in Two Days: 3D Elastic Orthorhombic

Modeling with OpenAcc. In Third EAGE Workshop on High Performance Computing for Upstream.

- Vladimir Kazei and Tariq Alkhalifah (2017) Regularized Centered Differential Waveform Inversion, presented at the AGU annual meeting in New Orleans, USA
- Oleg Ovcharenko, Vladimir Kazei, Daniel Peter, and Tariq Alkhalifah (2017), Super-resolution time-lapse seismic waveform inversion, to be presented at the AGU annual meeting in New Orleans, USA
- Vladimir Kazei, Tariq Alkhalifah; (2017a). Centered differential waveform inversion with minimum support regularization. In 79th EAGE Conference and Exhibition 2017.
- Vladimir Kazei, Tariq Alkhalifah; (2017b). On the resolution of inversion for orthorhombic anisotropy. In 79th EAGE Conference and Exhibition 2017.
- Vladimir Kazei, Tariq Alkhalifah; (2017). Salt-body inversion with minimum gradient support and sobolev space norm regularizations. In 79th EAGE Conference and Exhibition 2017.
- Oleg Ovcharenko, Vladimir Kazei, Daniel Peter, and Tariq Alkhalifah, T. (2017). Variance-based salt body reconstruction. In 79th EAGE Conference and Exhibition 2017.
- Vladimir Kazei, Ekkehart Tessmer, and Tariq Alkhalifah (2016) Scattering angle-based filtering via extension in velocity. SEG Technical Program Expanded Abstracts 2016: pp. 1157-1162. doi: 10.1190/segam2016-13870908.1
- Vladimir Kazei, Ekkehart Tessmer, and Tariq Alkhalifah (2016) Efficient Deflection Angle Based Filtering for Waveform Inversion. In 7th EAGE Saint Petersburg International Conference and Exhibition.
- Vladimir Kazei, Boris Kashtan, Vladimir Troyan and Wim Mulder, FWI spectral sensitivity analysis in the presence of a free surface // SEG International Exposition and 85th Annual Meeting in New Orleans 2015, Louisiana
- Vladimir Kazei, Boris Kashtan, Vladimir Troyan and Wim Mulder, Free-surface Multiples and full-waveform inversion spectral resolution // 77th EAGE Conference and Exhibition 2015, oral presentation
- Vladimir Kazei, Boris Kashtan, Vladimir Troyan and Wim Mulder, FWI sensitivity analysis in the presence of free-surface multiples// 2013 SEG Workshop, Muscat, Oman, Full Waveform Inversion: From Near Surface to Deep, oral presentation.
- Vladimir Kazei, Boris Kashtan, Vladimir Troyan and Wim Mulder, Spectral sensitivity analysis of FWI in a constant-gradient background velocity model// EAGE Conference London 2013 Expanded Abstracts presented as poster Tu-P04-11.
- Vladimir Kazei, Andrey Ponomarenko Boris Kashtan, Vladimir Troyan and Wim Mulder, On the contribution of head waves to full waveform inversion// EAGE Conference Copenhagen 2012 Expanded Abstracts presented as poster P341.

REFERENCES

Prof. Dr. Tariq Alkalifah (supervisor at KAUST),
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