

# Oleg Ovcharenko, PhD.

oovcharenko@nvidia.com  
ovcharenkoo.com

+971 50 5218561  
github.com/ovcharenkoo

Dubai, United Arab Emirates  
linkedin.com/in/ovcharenkoo

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## EXPERIENCE

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### NVIDIA

*Solutions Architect*

Jan 2022 – now

*Dubai, UAE*

- Covering broad range of technologies with focus on generative AI and accelerated computing.
- LLM training / fine-tuning with NeMo framework. LLM inference with Triton Inference Server and TensorRT
- Building components and scenes for 3D digital twins of industrial facilities in Omniverse
- Edge video-analytics with DeepStream on Jetson devices
- Enabling GPU-accelerated data analytics with RAPIDS / Spark
- Developing and optimizing codes in CUDA for seismic data processing
- Other miscellaneous tasks such as configuration of Slurm clusters with DeepOps, inference for ASR / TTS from Riva

### ExxonMobil

*Geoscience and Machine Learning Intern (NextGen processing team)*

Sep 2020 – Dec 2020

*Spring, TX, USA*

- Conducted research of a machine learning method for surface-related multiple elimination. Focused on acoustic waveform separation methods from natural language processing field. Completed the feasibility study and submitted a technical report to the SEG 2021 annual meeting.
- Implemented the deep learning model in Python using PyTorch. The solution is featuring several neural networks connected with custom loss functions and focusing on orthogonal embeddings in the latent space.

Advisors: Anatoly Baumstein and Erik Neumann

### CGG

*Machine Learning Engineer Intern (AI lab)*

Aug 2019 – Feb 2020

*Crawley, United Kingdom*

- Implemented an unsupervised deep learning approach from a computer vision research paper. The solution addressed the image restoration task by a Generative Adversarial Network (GAN). Demonstrated an application on marine field data and published a technical report at the EAGE Digital 2020.
- Developed a module for image data augmentations and pre-processing using Python and PyTorch.

Advisor: Song Hou

### MedSeis

*Co-Founder*

Feb 2018 – Mar 2019

*Thuwal, Saudi Arabia*

- Led a biotech start-up to create a radiation-free dental imaging device empowered by full-waveform inversion. Orchestrated the teamwork and pitched to investors. Raised funding of \$30,000 for proof-of-concept study.
- Built a high-profile team of 5 bright minds including a medical imaging expert, electrical engineer, physicist, and marketing professional. The hardware solution appeared to be immature for deploying at a commercial scale.

### KAUST Innovation Fund

*Venture Capital Intern*

Mar 2017– Sep 2017

*Thuwal, Saudi Arabia*

- Assisted managers in evaluating the university-based start-ups, which included the research of the technology, markets, and financials. Learned a lot by watching tens of pitches and understanding the following decisions.

### The Schmidt Institute of Physics of the Earth

*Engineer (Tectonophysics lab)*

Jun 2013– Jul 2014

*Moscow, Russia*

- Conducted research of stress state in the Earth crust of Western Europe. Applied the Method of Cataclastic Analysis of Discontinuous Displacements to focal mechanisms data for that region. Published a journal paper.

## PERSONAL PROJECT

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Telegram (messenger) bot for stock data analysis. The core functionality includes web-scraping of financial data, data analytics, handling requests from messenger and web-interface. Built with Python, Django, MySQL, Redis, Telegram API, Docker. The service is deployed in the AWS using Lambda, EC2, ElastiCache, RDS.

## EDUCATION

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### King Abdullah University of Science and Technology

Nov 2021

*PhD, Geophysics and Machine Learning*

*Thuwal, Saudi Arabia*

- Data-driven methods for the initialization of seismic full-waveform inversion

Advisor: Daniel Peter and Tariq Alkhalifah

### Paris Diderot University (Institut de Physique du Globe de Paris)

Jul 2015

*Master, Exploration Geophysics*

*Paris, France*

- Accurate operators for 2D elastic seismogram calculation under geological discontinuities with regular meshing.

Advisors: Nobuaki Fuji and Roland Martin

### Lomonosov Moscow State University

Dec 2014

*Master, Physics*

*Moscow, Russia*

- Analytical analytical solutions for viscous flow in the lithosphere subject to exogenous processes and isostasy.

Advisor: Yuriy L. Rebetsky

## SELECTED HONORS & AWARDS

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SEG ExxonMobil Upstream Research Company Scholarship	2019
NVIDIA-KAUST GPU Hackathon, won 1st award out of 7 teams	2018
Cornell Graduate School of Management, Certificate in Entrepreneurship	2018
EAGE GeoQuiz, won 3rd award out of 37 teams worldwide	2017

## PUBLICATIONS

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### Selected Conference & Journal Articles (in reverse chronological order)

- [1] Ovcharenko, O., V. Kazei, T. Alkhalifah, and D. Peter. *Multi-task learning for low-frequency extrapolation and elastic model building from seismic data*, in *IEEE Transactions on Geoscience and remote sensing*. 2022, IEEE.
- [2] Alkhalifah, T. and O. Ovcharenko, *Direct domain adaptation through reciprocal linear transformations*. ArXiv, 2021.
- [3] Ovcharenko, O., A. Baumstein, and E. Neumann, *Surface-related multiple elimination through orthogonal encoding in the latent space of convolutional autoencoder*, in *SEG Technical Program Expanded Abstracts 2021*. 2021, Society of Exploration Geophysicists.
- [4] Ovcharenko, O., V. Kazei, D. Peter, and T. Alkhalifah. *Transferring elastic low frequency extrapolation from synthetic to field data*. in *83th EAGE Conference and Exhibition 2021*. 2021. European Association of Geoscientists & Engineers.
- [5] Ovcharenko, O., V. Kazei, D. Peter, I. Silvestrov, A. Bakulin, and T. Alkhalifah, *Dual-band generative learning for low-frequency extrapolation of the near-surface land data*, in *SEG Technical Program Expanded Abstracts 2021*. 2021, Society of Exploration Geophysicists.
- [6] Kazei, V., O. Ovcharenko, and T. Alkhalifah, *Velocity model building by deep learning: From general synthetics to field data application*, in *SEG Technical Program Expanded Abstracts 2020*. 2020, Society of Exploration Geophysicists. p. 1561-1565.
- [7] Kazei, V., O. Ovcharenko, P. Plotnitskii, D. Peter, T. Alkhalifah, I. Silvestrov, A. Bakulin, and P. Zwartjes, *Elastic near-surface model estimation from full waveforms by deep learning*, in *SEG*

- Technical Program Expanded Abstracts 2020*. 2020, Society of Exploration Geophysicists. p. 3872-3876.
- [8] Kazei, V., O. Ovcharenko, P. Plotnitskii, D. Peter, X. Zhang, and T. Alkhalifah. *Deep learning tomography by mapping full seismic waveforms to vertical velocity profiles*. in *82nd EAGE Annual Conference & Exhibition*. 2020. European Association of Geoscientists & Engineers.
- [9] Kazei, V., O. Ovcharenko, P. Plotnitskii, D. Peter, X. Zhang, and T.A. Alkhalifah, *Mapping full seismic waveforms to vertical velocity profiles by deep learning*. 2020.
- [10] Ovcharenko, O. and S. Hou. *Deep Learning for Seismic Data Reconstruction: Opportunities and Challenges*. in *First EAGE Digitalization Conference and Exhibition*. 2020. European Association of Geoscientists & Engineers.
- [11] Ovcharenko, O., V. Kazei, P. Plotnitskiy, D. Peter, I. Silvestrov, A. Bakulin, and T. Alkhalifah, *Extrapolating low-frequency prestack land data with deep learning*, in *SEG Technical Program Expanded Abstracts 2020*. 2020, Society of Exploration Geophysicists. p. 1546-1550.
- [12] Plotnitskii, P., V. Kazei, O. Ovcharenko, D. Peter, and T. Alkhalifah. *Extrapolation of Low Wavenumbers in FWI Gradients by a Deep Convolutional Neural Network*. in *82nd EAGE Annual Conference & Exhibition*. 2020. European Association of Geoscientists & Engineers.
- [13] Kazei, V., O. Ovcharenko, T. Alkhalifah, and F. Simons. *Realistically textured random velocity models for deep learning applications*. in *81st EAGE Conference and Exhibition 2019*. 2019. European Association of Geoscientists & Engineers.
- [14] Kazei, V., O. Ovcharenko, P. Plotnitskii, D. Peter, X. Zhang, and T.A. Alkhalifah, *Mapping seismic data cubes to vertical velocity profiles by deep learning: New full-waveform inversion paradigm?* 2019.
- [15] Ovcharenko, O., V. Kazei, M. Kalita, D. Peter, and T.A. Alkhalifah, *Deep learning for low-frequency extrapolation from multi-offset seismic data*. *GEOPHYSICS*, 2019. **84**(6): p. R1001-R1013.
- [16] Ovcharenko, O., V. Kazei, D. Peter, and T. Alkhalifah, *Style transfer for generation of realistically textured subsurface models*, in *SEG Technical Program Expanded Abstracts 2019*. 2019, Society of Exploration Geophysicists. p. 2393-2397.
- [17] Ovcharenko, O., V. Kazei, D. Peter, and T. Alkhalifah. *Transfer learning for low frequency extrapolation from shot gathers for FWI applications*. in *81st EAGE Conference and Exhibition 2019*. 2019. European Association of Geoscientists & Engineers.
- [18] Peter, D., F. Chen, O. Ovcharenko, A.E. Carmona, and Q. Liu. *Improving full-waveform inversions using spectral-element seismic wave propagation on emerging HPC architectures*. in *Geophysical Research Abstracts*. 2019.
- [19] Plotnitskii, P., T. Alkhalifah, O. Ovcharenko, and V. Kazei, *Seismic model low wavenumber extrapolation by a deep convolutional neural network*. *ASEG Extended Abstracts*, 2019. **2019**(1): p. 1-5.
- [20] Ovcharenko, O., J. Akram, and D. Peter. *Feasibility of moment tensor inversion from a single borehole data using Artificial Neural Networks*. in *GEO Bahrain 2018*. 2018. Search and Discovery.
- [21] Ovcharenko, O., V. Kazei, D. Peter, and T. Alkhalifah, *Variance-based model interpolation for improved full-waveform inversion in the presence of salt bodies*. *Geophysics*, 2018. **83**(5): p. R541-R551.
- [22] Ovcharenko, O., V. Kazei, D. Peter, and T. Alkhalifah, *Variance-based salt body reconstruction for improved full-waveform inversion*. *Geophysics*, 2018. **83**: p. R541-R551.
- [23] Ovcharenko, O., V. Kazei, D. Peter, X. Zhang, and T. Alkhalifah. *Low-frequency data extrapolation using a feed-forward ANN*. in *80th EAGE Conference and Exhibition 2018*. 2018. European Association of Geoscientists & Engineers.
- [24] Akram, J., O. Ovcharenko, and D. Peter, *A robust neural network-based approach for microseismic event detection*, in *SEG Technical Program Expanded Abstracts 2017*. 2017, Society of Exploration Geophysicists. p. 2929-2933.
- [25] Ovcharenko, O., V. Kazei, D. Peter, and T. Alkhalifah. *Neural network based low-frequency data extrapolation*. in *3rd SEG FWI workshop: What are we getting*. 2017.
- [26] Ovcharenko, O., V. Kazei, D.B. Peter, and T. Alkhalifah. *Super-resolution Time-Lapse Seismic Waveform Inversion*. in *AGU Fall Meeting Abstracts*. 2017.

- [27] Ovcharenko, O.O., V.V. Kazei, D. Peter, and T. Alkhalifah. *Variance-based salt body reconstruction*. in *79th EAGE Conference and Exhibition 2017*. 2017. European Association of Geoscientists & Engineers.
- [28] Fuji, N., O. Ovcharenko, R. Martin, and C. Cuvilliez. *Simple and accurate operators based on Taylor expansion for 2D elastic seismogram calculation under geological discontinuities with regular cartesian grids*. in *78th EAGE Conference and Exhibition 2016*. 2016. European Association of Geoscientists & Engineers.

## LEADERSHIP & SERVICES

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<b>EAGE AI Committee</b> , <i>Member</i>	2021
<b>Reviewer</b> , <i>Geophysics, Geophysical Journal International, IEEE TGRS</i>	2018
<b>SEG Student Chapter</b> , <i>President of the KAUST SEG Student Chapter</i>	2017

## SKILLS & INTERESTS

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**Programming:** Python, MATLAB, C/C++, CUDA

**Frameworks and libraries:** PyTorch, TensorFlow, RAPIDS, Pandas, NumPy, SciPy, Git, etc.

**Languages:** English(fluent), Russian(native), French(intermediate), Arabic (beginner)

**Interests:** BJJ, golfing, playing guitar, watching sumo wrestling