Đorđe Miladinović

Curriculum Vitæ

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djordjemila

Software Engineer | Machine Learning Researcher | PhD in Computer Science

Skills & Highlights

Mainly coding in	Python • PyTorch • Tensorflow • C/C++ • Java • Matlab • Bash • SQL • LaTeX
Experienced in	Torch • HTML • CSS • Jekyl • Javascript • NodeJS • MongoDB • PostgreSQL • Blender • C#
Frameworks used	Unix • Git • SVN • PyTorch-Lightning • Fairseq • NLTK • OpenCV • Pandas • Scikit-learn • SciPy • NumPy • Scrapy • Django • ROS • UML • Amazon AWS • Hadoop MapReduce • MS Office • Excel
Background in	Software Design • Algorithms & Data Structures • Operating Systems • Microprocessors & Embedded Systems
Research areas	Deep Learning • Generative Modeling • Computer Vision • Natural Language Processing • Applied ML
Worked with	Prof. Joachim Buhmann • Prof. Jürgen Schmidhuber • Prof. Bernhard Schölkopf • Prof. Otmar Hilliges

Education

Sep'17-Jun'21 **ETH Zürich – PhD in Computer Science – Machine Learning**.
- Thesis: "On Training Deep Generative Models with Latent Variables" with Prof. Joachim Buhmann.
- Focus: Generative image and text modeling | variational autoencoders | representation learning | deep learning for biology.

Sep'13-Jun'16 **ETH Zürich – MS in Computer Science**.
- Thesis: "Perceptual Analysis Framework for Discovering Anomalies in Humanoid Arm Motions" with Prof. Otmar Hilliges.
- Focus: Software engineering | distributed computing | machine learning.

Sep'09-Sep'13 **University of Belgrade – BS in Electrical Engineering & Computer Science**.
- Focus: Software/hardware engineering and design.

Work Experience

Feb'17-Present **ETH Zürich, Institute for Machine Learning – Research Scientist**.
- [Python/PyTorch] I led a team of researchers to develop a web platform that uses convolutional neural networks to recognize sleep patterns from brain signals (`https://sleeplearning.ethz.ch`) – *over 10'000 submissions worldwide*.
- [Python/PyTorch] I co-invented a new type of neural network for realistic image synthesis and then using it *developed a state-of-the-art variational autoencoder* for image modeling (`github.com/djordjemila/sdn`).

Research, development and *project management* in interdisciplinary collaborations:
- *Zurich Exhalomics* (`https://hochschulmedizin.uzh.ch/zurich-exhalomics`) – I led a team of students to develop a tool that automatically calibrates the mass spectrum of human breath, and also a machine-learning algorithm to detect causal relations between metabolites in the human body and sleep stages (relating metabolism to sleep).
- *Sleep Loop* (`sleeploop.ch`) – I co-developed an algorithm to recognize sleep stages from wireless device recordings.
- *VirtaMed collaboration* (`https://www.virtamed.com`) – I developed a machine-learning algorithm with UI to evaluate the performance of trainee surgeons on a virtual surgery simulator (see demo at `https://bit.ly/2PJqY2J`).

Sep'18-Dec'18 **Max Planck Institute for Intelligent Systems – Research Scientist**.
- [Python/PyTorch] I applied principles of causal reasoning to (i) develop a neural network architecture that improves unsupervised learning of dynamical systems across environments; (ii) validate representations of deep generative models.

Sep'16-Feb'17 **Logitech Europe S.A. Data Science & Advanced Analytics – Software Engineer | ML Engineer**.
- [Python/SQL] I developed a machine-learning algorithm that (i) collects and processes user activity logs for a Logitech product from the database; (ii) uses processed data to identify user cohorts and perform targeted advertising.
- [Java/Scrapy] I implemented a natural language processing algorithm that (i) scraps opinions from Amazon reviews on different Logitech products; (ii) automatically analyzes the sentiments from those reviews for different product aspects.

Jan'16-Sep'16 **Disney Research Zürich, Vision and Sensing Research Group – Research Scientist**.
- [Python/C++/Matlab/Blender/HTML/CSS] I designed a framework for detecting mechanical failures in Disney's humanoid robots based on IMU sensor readings. It utilizes a machine-learning algorithm that provides the human-like judgment on robot degradation. To provide training data for the algorithm, I also designed a web survey in which the participants compared graphical renderings of proper and degraded human motions.

Languages

Serbian (Native), English (Fluent), German (B1), Spanish (Beginner)

Academic Activities

Dec'19 I co-organized the "Disentanglement Challenge" at NeurIPS 2019 (`bit.ly/36bTD4W`).

2017-2021 Reviewer at NeurIPS, ICML and ICLR.

2017-2020 Taught "Advanced Machine Learning" and "Statistical Learning Theory" at ETH Zürich.

2017-2020 Supervised more than 10 MS students (`https://djordjemila.github.io/#teaching-mentoring`).

Selected Publications

[1] **Đorđe Miladinović**, Aleksandar Stanić, Stefan Bauer, Jürgen Schmidhuber & Joachim M. Buhmann
Spatial Dependency Networks: Neural Layers for Improved Generative Image Modeling
International Conference on Learning Representations, **ICLR 2021**

[2] Raphael Suter, **Đorđe Miladinović**, Stefan Bauer & Bernhard Schölkopf
Robustly Disentangled Causal Mechanisms: Validating Deep Representations for Interventional Robustness
International Conference on Machine Learning, **ICML 2019**

[2] **Đorđe Miladinović**, Muhammad Waleed Gondal, Bernhard Schölkopf, Joachim M. Buhmann & Stefan Bauer
Disentangled state space representations
DeepGen workshop, International Conference on Representation Learning, **ICLR 2019**

[3] **Đorđe Miladinović** et al.
SPINDLE: End-to-end Learning from EEG/EMG to Extrapolate Animal Sleep Scoring Across Experimental Settings, Labs and Species, **PloS Computational Biology 2019**

See the complete list at `https://djordjemila.github.io/#publications`

Hobbies

Waterpolo • Swimming • Skiing and snowboarding • Tennis • Cinematography • Reading