

Bruno Gavranović

APRIL, 2019

Zagreb, Croatia

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Computer Science student interested in the intersection of Category Theory and Machine Learning

Experience

Strongly Typed Ltd.

Zagreb, Croatia

BACKEND HASKELL DEVELOPER

Sep. 2018. - March 2019.

- Learned and contributed to the internals of a large codebase involving lenses, monad transformers, an effect system, type-level API and template haskell
- Worked on a fleet-management system for restaurant delivery
- Worked on delivery optimization and business logic implementation

TakeLab (Text Analysis and Knowledge Engineering Lab)

Zagreb, Croatia

MASTER STUDENT UNDER THE SUPERVISION OF ASSOC. PROF. DR. SC. JAN ŠNAJDER

Sept. 2015 - present

- Completed several projects as a part of the university curriculum
 - Bachelor thesis: *Application of Deep Learning for Sentiment Analysis*
 - Diploma Seminar - implementation of *Differentiable Neural Computers*
 - Master thesis - ongoing - *Compositional Deep Learning*
- Organized a deep learning paper reading group

Talks

Generative Adversarial Networks, Databases, and Automatic Differentiation

Glasgow, UK

2ND SYMPOSIUM ON COMPOSITIONAL STRUCTURES

Dec. 2018

Generative Adversarial Networks

Petnica, Serbia

PETNICA SUMMER SCHOOL OF MACHINE LEARNING

2017., 2018.

Projects

Framework for automatic differentiation

Zagreb, Croatia

OPEN SOURCE PROJECT

Mar. 2017. - Jan. 2018.

- Developed an efficient, general TensorFlow-like framework for backpropagation in Python
- Implemented dynamic computational graphs, higher order derivatives, tensor differentiation and more

Reimplemented a dozen of state of the art deep learning papers and frameworks

Zagreb, Croatia

HIGHLIGHTS INCLUDE

Feb. 2017. - Present

- **Backprop as Functor:** Haskell implementation of a category-theoretic formulation of neural networks
- **Differentiable Neural Computer:** DeepMind's 2016 Nature paper, neural network architecture capable of learning algorithms
- **Generative Adversarial Networks:** DCGAN, Wasserstein GAN, CycleGAN and others
- **Decoupled Neural Interfaces:** a novel approach to distributed training of networks

BEST Spring Course (Board of European Students of Technology)

Zagreb, Croatia

MAIN ORGANIZER

2015.

- Organized an international 10-day seminar on technology
- Coordinated a team of 12 people (PR, FR, HR, Logistics, Design, Web)
- 1 ECTS point worth of academic lectures taught by university professors

Education

Faculty of Electrical Engineering and Computing, University of Zagreb

Zagreb, Croatia

MASTER STUDIES, COMPUTER SCIENCE

2016. - present

UNDERGRADUATE STUDIES, COMPUTER SCIENCE

2013. - 2016.

- Semester abroad as a part of student exchange

Additional education, awards & recognition

- 2019. **Recipient**, Helium Grant
- 2019. **Participant**, Applied Category Theory School *Oxford, UK*
- 2018. **Participant**, Applied Category Theory workshop *Leiden, Netherlands*
- 2018. **Participant**, Hackmind - 3 month paid fellowship in startup building *Berlin, Germany*
- 2017. **Finalist**, AI Grant
- 2012. **Honorable mention**, 6th International Olympiad on Astronomy and Astrophysics *Rio de Janeiro, Brazil*

Knowledge & Abilities

TECHNICAL SKILLS

- **Programming:** Haskell, Python, Java, Idris, SQL, C
- **Other:** reading research papers, linux, git, vim, zsh, PyTorch, TensorFlow

LANGUAGES

- English (C1.1), Spanish (B1), Croatian (Native)

Interests & Activities

Interests Category Theory, Optimizing workflow, Self-improvement, Piano, Guitar

- Misc.** Alumni of BEST (Board of European Students of Technology)
Member of the winning team in the Red Bull Gravity Challenge

Zagreb, 2015.