



**EuroHPC**  
Joint Undertaking



**HRVATSKI CENTAR  
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Workshop

## **Deep learning through examples using Keras**

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### **Abstract**

In the workshop you will learn how to properly use artificial neural networks through practical examples from machine learning. In recent years, the use of deep learning has spread from academic circles and found its place in industry, advertising, healthcare, banking, security and so on. In the workshop, we will present the most useful neural network architectures and their components. We will implement the models within the Colaboratory cloud service, which already includes all the necessary software and enables easy code sharing and execution on Google's high-performance infrastructure (GPU, TPU). Through examples, you will learn about the main types of data we encounter in machine learning and how we use them as input or output with neural networks. We will present guidelines that lead us in designing an appropriate model and the common obstacles we encounter in deep learning, together with the typical tricks how to circumvent those obstacles.

Course content: design of the Keras library, neural networks training basics, useful regularizations, time series modeling, convolutional neural networks, embeddings, learning from heterogeneous data. Knowledge of the basics of machine learning and Python language is recommended for participants.

### **CV**

Rok Hribar is a researcher at Computer Systems department, Jožef Stefan Institute, Ljubljana, Slovenia. Most recently he is involved in several projects that deal with applying artificial intelligence and deep learning in real-world industrial practice with applications in device condition monitoring, self-driving industrial carts and healthcare. However, his research focus is most notably automatic differentiation of programs and gradient based optimization especially when applied to machine learning and large-scale optimization. He applied this methodology to various use cases including deep learning, time series forecasting, representation learning, clustering, deep reinforcement learning, simulation based optimization, similarity learning and others. His work found applications in genetics, molecular dynamics, biomedical knowledge discovery, transportation, acoustics, logistics and others. He lead numerous lectures and workshops especially on the practical aspects and use of modern approaches in deep learning, customized machine learning and gradient based optimization.