# ALEXANDER BUYANTUEV

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## EDUCATION

**HSE University** — Saint-Petersburg, Russia
*Bachelor of Applied Mathematics and Computer Science* — *Sep. 2020 - Aug. 2024*
- **Relevant courses**: *Algorithms and Data Structures, C/C++, Java, Python for Web, Python for Backend, Machine Learning, Databases, Computer Networks, Calculus, Linear Algebra, Discrete Mathematics, Probability Theory, Math Statistics*
- **Yandex Data School courses**: *Machine Learning, Natural Language Processing, Reinforcement Learning*
- **AI Talent Hub courses**: *Project Management in Data Science*

## SKILLS

**Programming languages**: Python, C/C++, Java
**Technologies and Frameworks**: git, SQL, PyTorch, Docker, FastAPI
**Languages**: Russian, English (C1)

## WORK EXPERIENCE

**RL Researcher** — *Sep. 2023 - Present*
Huawei R&D, Network Scheduling Team — Saint Petersburg, Russia
**Linear erasure codes construction using reinforcement learning** | *Python* — Sep. 2023 - Present
- Researched the application of **DDQN** and **SAC** algorithms for designing linear erasure codes
- Developed an evaluation strategy using FastAPI to **speed up** the training up to **50 times**
- **Increased the accuracy** of evaluation from $10^{-3}$ to $10^{-6}$
- **Compared** obtained linear erasure codes with FlexFEC and Reed-Solomon codes in Bernoulli and Simple-Gilbert loss models
- **Showcased the advantage** of RL designed codes in **performance** and **decoding complexity**

**Software Engineer Intern** — *Nov. 2022 - Sep. 2023*
Huawei R&D, Cangjie Team — Saint Petersburg, Russia
**CSV support for Data-Driven Testing in Cangjie** | *Cangjie* — Sep. 2023
- Implemented CsvParser in Cangjie to **parse** data from CSV files
- Developed CsvStrategy to provide data for unit tests and **contributed** it to Cangjie Test Framework

**LLVM IR decompiler for Cangjie** | *C++, Python, GoogleTest* — Nov. 2022 - June 2023
- Designed a tool to represent LLVM IR module in C-like format that restores packages, classes and functions from Cangjie source code to **speed up** compiler's generated code analysis
- Implemented LLVM GEP instruction printer to show class field and it's type when accessed by the pointer to **improve** code readability
- Downloaded source code from 300+ open projects on Cangjie and created test cases from source code to **test** the tool
- Developed a parallel testing framework that runs 30 test cases with 100000 lines each under 1 minute to **fix bugs** in my tool
- **Distributed** the tool inside Cangjie Team for analysis of compiler's generated code by other developers

## PROJECTS

**Multilingual Embedding-based Machine Translation** ⓞ | *Python* — Sep. 2023
- Loaded **embeddings** for Russian and Ukranian
- Implemented embedding space mapping using **Linear Regression**
- **Increased** results with orthogonal transformation **SVD**
- Developed **word-based translator** from Ukranian to Russian

**YouTube videos comments project** ⓞ | *Python* — Apr. 2022
- **Trained GPT-2 Large** on dataset of US videos and comments
- Developed an app to interact with the model using PyTube and Gradio
- Uploaded project to **Hugging Face**

**Hybrid Strategy for Timeseries** ⓞ | *Python* — Apr. 2022
- Implemented hybrid strategy for timeseries from **this dataset**
- The solution got **MSE 33.97**

**ResNet18** ⓞ | *Python* — Mar. 2021
- Developed ResidualBlock, ResNetLayer, ResNet18 using PyTorch

**Backpropagation** ⓞ | *Python* — Feb. 2022
- Implemented backprop for **BatchNormalization**
- Implemented backprop for **Dropout**