Vsevolod Nedora, Ph.D.

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I am a Data Scientist with a background in computational astrophysics and 5+ years in numerical modeling and data analysis. I led research and software development projects, involving computational fluid dynamics (CFD), radiation transport and machine learning. My strengths are understanding complex problems, converting solutions into code, and communicating key insights from data.

I am looking for a new position in Berlin/Brandenburg from September 2024.

TECHNICAL SKILLS

5+ years: Python, C++, Bash, LaTeX; 2024: SQL
- **Software Engineering**: OOP;
    NumPy, SciPy, H5py, Matplotlib, scikit-learn, PyTorch, pandas
  - designed and maintained PyBlastAfterglow, a C++ code with Python interface to model gamma-ray burst afterglows
- **Data Analysis**: regression, Bayesian statistics, model fitting
  - performed model selection based on chi-squared statistics employing a dataset with large systematic uncertainties
- **Machine Learning**: PCA, SVM, random forest, Gaussian process, RNN, CNN
  - built a surrogate afterglow model, AfterglowNet, using conditional variational autoencoder neural network
- **Numerical Modelling**: ODEs, PDEs, computational fluid dynamics
  - Implemented adaptive step-size ODE and PDE (Fokker-Planck) solvers in C++

PROFESSIONAL EXPERIENCE

Max-Planck-Institut für Gravitationsphysik, Potsdam, Germany　　　　2021 – Present
Researcher and Data Scientist
- ported PyBlastAfterglow, originally written in Pyhton, to C++; optimized performance; extended functionality (added image generation, analysis)
  - achieved 10 times speed increase
  - improved code was used in 5+ peer-reviewed publications
- collaborated with international groups, providing consulting/editing services
  - co-authored 5+ peer-reviewed publications in high impact journals

Friedrich-Schiller-Universität, Jena, Germany　　　　　　　　　2018 – 2021
Researcher (Ph.D. candidate)
- developed python code PyBlastAfterglow for modelling gamma-ray afterglows

- published simulation results in 3 publications in high impact journals
- created and maintained a big data processing and analysis pipeline
  - analyzed 30+ terabytes of data from global CFD simulations
  - several groups employed the data products generated by the pipeline; resulted in 10+ publications

- performed end-to-end data analysis, including data collection, cleaning, feature engineering, exploratory data analysis and modelling
  - identified the best-fitting model via a multitude of criteria, including chi-squared statistics
  - the final model and dataset were used by multiple international research groups and have 650+ downloads

EDUCATION

Friedrich-Schiller-Universität Jena, Jena, Germany   2021
Ph.D. in Theoretical Physics
- 4 first-author publications
- Grade: Magna Cum Laude

Universität Bonn   2018
Master's degree in Astrophysics

BUSINESS SKILLS

- **RnD**
  - developed methods to approximate complex systems with semi-analytical methods
  - participated in the development of novel methods to solve radiation transport problems in non-trivial environments
- **Leadership**
  - supervised 100+ students through programming courses and exams
  - performed weekly supervision of 10+ students in projects related to computational fluid dynamics with an outcome of a deployable code and project report
- **Reporting**
  - participated in multiple weekly group meetings, presenting progress reports and evaluating the progress of other group members
- **Communication**
  - 15 peer-reviewed publications (6 first author) in high-impact scientific journals
  - 15 international conferences over 6 years with an average audience of 100+ people
  - was personally invited to give scientific talks in institutes in Israel and Italy