Christina Brester

PhD Student, University of Eastern Finland

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Education

- **University of Eastern Finland, Kuopio, Finland**
  Doctoral Degree in Environmental Physics, Health and Biology, estimated 2022
- **Siberian State Aerospace University, Krasnoyarsk, Russia**
  Candidate of Technical Sciences, thesis: "Cooperative Evolutionary Method for Multi-objective Optimization in Speech Analysis", 2016
- **Siberian State Aerospace University, Krasnoyarsk, Russia**
  MSc in System Analysis and Control, diploma with honors 5.0/5.0, 2014

Work experience

02/2018 - present **University of Eastern Finland, Kuopio, Finland**
Researcher

Created a pipeline using Python to post-process NGS-data and predict bacterial abundances in drinking water distribution systems (index of agreement exceeded 80%);
Used Keras to implement feedforward and recurrent neural networks for weather-based fault prediction in energy grids; incorporated oversampling to predict rare peaks and gained 78% index of agreement;
Investigated conventional data-driven models in predicting cardiovascular diseases; proposed their modifications using evolutionary algorithms and implemented in C++, Python; achieved 74% accuracy with >30-year prediction horizon;
Teaching environmental and advanced environmental data mining (for students from environmental sciences).

09/2016 – 01/2018 **Siberian State University of Science and Technology, Krasnoyarsk, Russia**
Docent, Senior Lecturer

Developed course programs and taught mathematical analysis, linear algebra, analytical geometry (for engineering and economics students); prepared grant applications and received funding as a leader of three projects (more than 50 000 EUR in total).

10/2015 – 08/2016 **University of Eastern Finland, Kuopio, Finland**
Visiting Research Fellow

Developed and implemented in C++ an evolutionary feature selection method for the high-dimensional epidemiological data allowing to find different combinations of predictor variables that lead to the same model predictive ability. Published one conference paper and one journal article.

09/2013 – 06/2014 **Ulm University, Ulm, Germany** (8 months remotely and 1 month on-site)
Intern

Developed an evolutionary feature selection algorithm to extract informative acoustic characteristics from a speech signal; implemented in C++ and used to increase a classifier performance by up to 5.4% in speaker emotion recognition.
Published results in conference proceedings, including INTERSPEECH (Dresden, Germany, 2015), LREC (Reykjavik, Iceland, 2015), ICINCO (Colmar, France, 2015, *presenter* and Vienna, Austria, 2014, *presenter*).

04/2012 – 01/2013 **Siberian Integration Systems, Krasnoyarsk, Russia**
Analyst

Discussed with clients and formalized their requirements to a software application used for monitoring data and managing staff; developed the design specification of a mobile version and tested its quality.

Awards and Scholarships

- **Russian Presidential Fellowship** for young scientists to perform advanced research in priority areas of the Russian economy, 2018
- **Russian Presidential Fellowship** for study abroad, 2015
- **State Award** of Krasnoyarsk region for the high contribution to science, Russia, 2015
- **DAAD Scholar, Germany:** Leonhard-Euler Scholarship Program, 2013

Grants

- **EDUFI Fellowship, Finland**: a start-up grant for doctoral level students, 2018
  Project "Automated generation of mathematical models in epidemiology"
- Grants of **Russian Foundation for Basic Research and Government of Krasnoyarsk region**, 2018 and 2016
  Projects "Multi-objective design of predictive models with compact interpretable strictures in epidemiology" and "Automatic segmentation of the heart's left ventricle in magnetic resonance imaging based on the clustering approach"
- Grant of **Foundation for Assistance to Small Innovative Enterprises**, Russia, 2014
  Project "Speech-based speakers, speakers' gender and emotion recognition"

Recent publications*

- Brester C., Ryzhikov I., Siponen S., Jayaprakash B., Ikonen J., Pitkänen T., Miettinen I.T., Torvinen E., Kolehmainen M. (2020) Potential and limitations of a pilot-scale drinking water distribution system for bacterial community predictive modelling. *Sci Total Environ.* 717:137249. doi: 10.1016/j.scitotenv.2020.137249.
- Brester C., Niska H., Ciszek R., Kolehmainen M. (2020) Weather-based fault prediction in electricity networks with artificial neural networks. *IEEE World Congress on Computational Intelligence (IEEE WCCI)*. Accepted
- Koponen P., Ikäheim J., Koskela J., Brester C., Niska H. (2020) Assessing and Comparing Short Term Load Forecasting Performance. *Energies*. 13:2054.
- Brester C., Ryzhikov I., Semenkin E., Kolehmainen M. (2019) On a restart metaheuristic for real-valued multi-objective evolutionary algorithms. *Genetic and Evolutionary Computation Conference (GECCO) (Companion)*, pp. 197-198.
- Brester C., Kauhanen J., Tuomainen T.-P., Voutilainen S., Rönkkö M., Ronkainen K., Semenkin E., Kolehmainen M. (2018) Evolutionary methods for variable selection in the epidemiological modeling of cardiovascular diseases. *BioData Min*. 11:18. doi: 10.1186/s13040-018-0180-x.

Other merits

- Chairing: International Joint Conference on Computational Intelligence (IJCCI 2019), Vienna, Austria; International Workshop on Mathematical Models and their Applications (IWMMA 2016), Krasnoyarsk, Russia
- Reviewing: IWMMA conference articles

Language Skills (self-assessment)

Russian – Native
English – Advanced
Finnish – Beginner

* More publications on christinabrester.com