Dr. Lars **Buntemeyer**

Research Software Engineer · Data Scientist

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Summary

I am a research software engineer, data scientist and lead developer at the Climate Service Center Germany (GERICS) developing the regional earth system model REMO. This work also includes the development and maintenance of the surrounding python software packages for managing the model pipeline from preprocessing and model run to postprocessing and analysis. I am heavily involved in the WCRP Coordinated Regional Downscaling Experiment (CORDEX) in which GERICS provides REMO model data to the community ensemble. I also host an open source python package (py-cordex) which should provide common tools and data to the community. In 2014, i gained my PhD at the University of Hamburg in the field of Computational Astrophysics.

Skills

Programming Python (OOP, SOLID, 6 years), Fortran (10 years), C++ (2 years), SciPy, HPC, MPI, NetCDF, Postgresql, Gitlab/Github.

Project Management Kanban, Gitflow Workflow

Education

Hamburg Observatory

Gojenbergsweg 112, 21029 Hamburg

PhD in Computational Astrophysics (magna cum laude) *May 2011 - Oct. 2014*

- Topic: massive star formation.
- Implementation of radiative transfer algorithms for AMR fluid dynamics.
- Thesis: ”Characteristics based Radiative Transfer forParallel Adaptive Mesh Refinement Hydrodynamics”.

University of Hamburg

Mittelweg 177, 20148 Hamburg

Diploma in Physics *Oct. 2004 - Sep. 2009*

- Major: Computational Physics.
- Minor: Computer Science.
- Thesis: ”3D Radiative Transfer in Radial Velocity Fields”.

Experience

Climate Service Center Germany

Fischertwiete 1, 20095 Hamburg

Research Software Engineer · Data Scientist *Nov 2014 - Present*

- Currently developing and maintaining the regional earth system model REMO and the surrounding python software packages. This included a major refactoring and documentation of the model code with a focus on the open-closed and single responsibilty principles according to the SOLID programming strategy and future porting capabilites for GPU computing.
- Implementation of parallel IO with NetCDF4 and a generic OASIS-MCT coupling interface into the REMO model during the Helmholtz ESM-Project.
- Team lead of five main fortran and python developers implementing a guerilla kanban method for project management. I also coordinate external contributions and lead a git-flow worfklow according to Vincent Driessen.
- Adminstration of internal gitlab instance including continuous integration with gitlab-runners and automatic documentation with sphinx.
- Implemented prototype postgresql database back and front-end for managing meta data and experiment configurations for the REMO model.
- Created visualizations and animations for public outreach, see, e.g., GERICS multimedia library.

University of Hamburg & Hamburg Observatory

Gojenbergsweg 112, 21029 Hamburg

PhD Candidate · Computational Astrophysics *May 2011 - Oct 2014*

- Implementation of radiative transfer algorithms for AMR fluid dynamics into the FLASH Code (Publication).
- Running high-performance hydrodynamical simulations of massive star formation.
- Tutor for undergraduate students.
- Gained PhD in 10/2014 (magna cum laude).

Publications

- Remedio AR, Teichmann C, Buntemeyer L, Sieck K, Weber T, Rechid D, Hoffmann P, Nam C, Kotova L, Jacob D. Evaluation of New CORDEX Simulations Using an Updated Köppen–Trewartha Climate Classification. Atmosphere. 2019; 10(11):726. DOI: 10.3390/atmos10110726
- Buntemeyer, L., Banerjee, R., Peters, T., Klassen, M., Pudritz, R., Feb. 2016. Radiation Hydrodynamics using Characteristics on Adaptive Decomposed Domains for Massively Parallel StarFormation Simulations. New Astronomy 43, 49-69. DOI: 10.1016/j.newast.2015.07.002
- Klassen, M., Kuiper, R., Pudritz, R. E., Peters, T., Banerjee, R., Buntemeyer, L., Dec. 2014. AGeneral Hybrid Radiation Transport Scheme for Star Formation Simulations on an AdaptiveGrid. Astrophysical Journal 797, 4. DOI: 10.1088/0004-637x/797/1/4