
Education

Ph.D. in Physics, University of California, San Diego

Sep 2013

- Thesis: Spiral Shock and Feathering Instabilities in Spiral Arms
- Relevant Coursework: Parallel Computing (OpenMP, MPI)

B.Sc. in Physics, Chinese University of Hong Kong

Sep 2007

Technical Experience

Alexa Skills on Amazon Echo devices ([astroph](#), [astroph Earth](#))

2017 – present

- ★ Allow users to listen to the 5 newest academic paper abstracts submitted to the preprint server ([arxiv.org](#)).
- Technologies: JSON, RSS, AWS Lambda, flask-ask, zappa
- <https://wingkitlee0.github.io/alexastroph/>

Open Source Contributions

2018 – present

- ★ [scikits.bvp_solver](#): A Python library for solving two-point boundary value problems, based on a well-known Fortran library. Technologies: Fortran, f2py, setuptools
- ★ [scikit-cuda](#): A Python wrapper for the [MAGMA](#) GPU linear algebra library, which allows drop-in replacement of scipy. Technologies: cuda, cusolver, blas, lapack

Data Science / Machine Learning Project (on-going)

2018 – present

- Use ML to classify whether an abstract belongs to any sub-category of astrophysics (multi-class classification). The task can be achieved using deep learning. Future work includes using LSTM to generate sample abstract. Technologies: keras, tensorflow, NLP

Arxiv Reader (Mobile)

2016

- ★ An app to browse papers via the RSS feeds from arxiv.org. Over a hundred of acquisitions.
- Technologies: .NET, C#, Visual Studio

Freelance Programmer

2009

- ★ A large Fortran application was parallelized using OpenMP. Resulted in nearly linear-scalability of the program on multi-core machines. Received a 5-star review for the project.
 - Technologies: Multi-threaded debugging, Fortran
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Academic Experience

Postdoctoral Associate, CIERA, Northwestern University, Evanston, IL

Aug 2016 – present

- Perform research on fluid dynamics of celestial objects, such as forming-planets and galaxies. Develop object-oriented C++ code to solve fluid problems based on the finite-difference method.
- Present published results in conferences/seminars as invited speaker.
- ★ Awarded Microsoft Azure Research Grant in 2017 for code development (\$20000)

Postdoc Fellow, Institute of Astronomy and Astrophysics, Taipei

Oct 2013 – Aug 2016

- Developed a Python program to perform parallel execution of Fortran code on the multi-node environment.
- Participated in team development of a high-performance computational fluid dynamics code. Developed a parallel solver for Poisson equation using Fast Fourier Transform.
- ★ Awarded a postdoctoral fellowship and a national paper award in 2015 for the project.
- Organized an [international workshop](#) and a [Hack Day](#). Taught a [course](#) on Python in a summer school.

Research Assistant, UC San Diego, La Jolla, CA

Aug 2008 – Sep 2013

- Created a new numerical algorithm to solve the coupled nonlinear differential equations.
 - ★ Awarded 200,000 cpu-hours from national computing facilities (Teragrid) to perform high-throughput parameter-sweeping calculations.
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Additional Information

Languages Chinese (Native), English (Professional)

Technical Skills (selected)

- Working: C++, Python, Git, bash shell, Fortran, Linux; Basic: C, CUDA
- Experience in HPC (OpenMPI), cloud computing (AWS, Azure), and machine learning (tensorflow, keras)
- Others: Mathematica, docker