https://wingkitlee0.github.io
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Wing-Kit Lee

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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/alexa_astroph/

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

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.

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