Namshik **Kim**

RESEARCH SCIENTIST · DATA SCIENTIST BASED ON DEEP LEARNING AND THEORETICAL PHYSICS · PhD

☐ (+1) 778-928-6576 | ✉ physhik@gmail.com | ⌂ http://physhik.com | ⃝ physhik | namshikkim

Summary

- Expertise in theoretical physics, numerical approximation, machine learning, and analytical problem solving
- Experience using deep learning techniques to develop AI-enabled smart phone features

Skills

Programming languages

- **Main** : Python work frames and libraries such as Keras, Tensorflow, Scikitlearn, Pandas, Numpy, Scipy, Matplotlib, PyPy, PILimage, Argparse, Librosa, Deepdish, BeatifulSoup.
- Wolfram Mathematica, Matlab : Numerical method for scientific research such as solving non-linear partial differential equations.
- **Intermediate** : SQL
- **Basic** : C, Fortran, PHP, Spark (PySpark)

Industrial skills

- Worked in Unix/Linux, Google documents, Vim, VS code environment
- Worked with Cloud : AWS EC2, S3 and also familiar to Google Cloud Service
- Worked with Git, Github, Bitbucket, ssh and familiar to Docker container

Model

- Deep learning : Supervised convolutional neural network (CNN), Unsupervised generative adversarial network (GAN), Deep reinforcement learning, Edge detection, familiarity to LSTM/RNN
- Other machine learning : Clustering, Hopfield net, Ising model, Variational inference, Bayesian inference, Variational autoencoder, Markov chain Monte-Carlo method, Regression, SVM and so on

Work and Research Experience

Experience : Research scientist at Soundcorset, Oct. 2017 - Sep. 2018, Vancouver/Seoul, S. Korea

- Developed a neural network model in Tensorflow, Keras, Scikitlearn, Librosa, Scipy, Numpy, PILimage, Matplotlib, Argparse to evaluate the quality of musical performances and provide helpful feedback to musicians using the Soundcorset app. The model's multi-class output determined instrument and musical genre, as well as provided quality ratings (good, medium, poor) and improve musician performance. This successful AI-enabled features using the model improved the user experience and significantly contributed to application upward adoption and popularity. Link
- Performed research into a cutting-edge Generative Adversarial Network (GAN)-based model in Tensorflow, Keras, Scikitlearn, Librosa, Scipy, Numpy, PILimage, Matplotlib, Argparse to translate a musician's recording into other genres of music. Utilized the latest deep-learning research to develop network topology, as well as proper digital-signal preprocessing (music to image) and postprocessing (image to music) methods (GAN/MUNIT).
- Researched and communicated state-of-the-art papers of GAN to teammates and multiple business stakeholders at various levels of technical understanding.

Personal projects, Oct 2018 - present

- Developed an electrocardiogram (ECG) classification method in TensorFlow, Keras, Scikitlearn, Numpy, Scipy, Deepdish, Argparse to identify different heart-beat patterns using convolutional neural network (CNN). Model could be used to diagnose irregular heart-beat patterns in clinical patients. Deepened my understanding of CNNs and confirmed correctness of existing research on a new dataset. Link
- Utilized the existing app template for the ECG project.
- Developed novel sabremetric model to determine baseball pitcher quality independent of teammates and game-day conditions. Method significantly improves prediction accuracy compared to existing linear regression-based methods. Developed a web crawler in Python using BeautifulSoup to scrape needed data and statistics. Github link
- Pedagogical reviews for deep learning models and problem solving for machine learning models such as soft K-means, Hopfield net, Ising model, Variational inference, Bayesian inference, Variational autoencoder, Markov chain Monte-Carlo method, Regression, SVM and so on. Homepage

Academy : PhD in Physics at University of British Columbia, Oct. 2011 - May 2017, Vancouver, BC, Canada

- Made the highly complicated geometrical models for impracticable graphene model.
- Built non-linear systematic models and tested numerically with Mathematica, Python, Matlab
- 5 scientific research papers in Journal of High Energy Physics, Physics Letter B. Refer to the research gate link

Education and conference

University of British Columbia   *Vancouver, BC, Canada*

PhD and MSc in Physics, String theory   *May 2017*

- *Linked thesis :* <Holographic gauge/gravity duality and symmetry breaking in semimetals>

Holography 2013: Gauge/gravity duality and strongly correlated systems   *Seoul, S.Korea*
Assistant Organizer and Presenter by APCTP   *Jun. 2013*
- Facilitated the organization of the conference and led workshops.
- Presented the string theory model introduced by <Holographic dynamical symmetry breaking of joined embedding>.

Teaching and Other Activity

Teaching at University of British Columbia   *2010 - 2016*
- Taught electronic circuit experiment in physics : Python programming and troubleshooting, grading
- Taught quantitative physics : Mechanics, Statistical mechanics, Mathematical Physics, amongst others

Other notable activities
- Military service : Observed and analyzed the weather for S. Korea Air Force
- Hobby : Baseball, Biking, Cooking, Hand drip coffee, Water painting, traveling for eating and visiting an art gallery, Yahoo fantasy league

Teaching and Other Activity