Kevin Liu Rodrigues

Data scientist, Researcher
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Research Scientist (ML/Dynamical systems)

PhD-trained scientist with excellent quantitative skills, I'm always trying to apply good practices and learn the most in everything I do. I accomplished a beautiful result on my PhD in which I was able to formulate a mathematical description of a simulation-intuited property of a dynamical system. Since then I have been working on applied machine learning and data science on various practical scenarios, where I have developed mostly as a programmer and data scientist working with data transformation, predictive and classification tasks.

INTERESTS

Emergence of properties on dynamical systems through statistical processes and the feedback loop where simulation and machine learning could contribute to the understanding on the subject, and how this knowledge could in turn help design better artificial systems.

EDUCATION

- **2016 - 2021** Ph.D. in statistical physics (Federal University of Minas Gerais, and exchange program at University of Michigan)
- **2012 - 2015** MSc in Applied physics (University of Campinas)
- **2008 - 2012** BSc in physics (University of Campinas)

GRADUATE COURSES & CERTIFICATIONS

- Fundamentals of Accelerated Computing with CUDA C/C++ (NVIDIA)
- Artificial Intelligence; Phase Transitions; Statistical Physics; Neuroscience (UFMG)
- Fundamental Problems in Statistical Physics, Summer School in Bruneck, Italy.
- Coursera: Introduction to Machine learning (2018), Bayesian statistics (2019)

PUBLICATIONS

- Paper: Rodrigues, Kevin Liu, and Ronald Dickman. "Synchronization of discrete oscillators on ring lattices and small-world networks." *Journal of Statistical Mechanics (2020)*
- Phd thesis: Synchronization of phase oscillators, UFMG (2021)
- Msc thesis: Capacitance spectroscopy of mass selected metallic nanoaggregates, Unicamp (2015)

LANGUAGES

Portuguese (native) - **English** (Fluent spoken/written)

PROFESSIONAL EXPERIENCE

2022 – Present: Data scientist & Data engineer at Moray

Description: Development of predictive models to aid crop management. Tasks involve working with spatiotemporal data, imperfect/missing data in addition to machine learning models.

Results:

- Definition of useful metrics to aid and guide learned models, as well as clients directly.
- Data processing pipelines to facilitate working with data from multiple sources, missing data, irregular sampling frequencies, etc.
- Application of different machine learning models depending on available data and required task, such as statistical inference models for dealing with noisy data, xgboost for regression and classification, and multi-layer perceptron models.

Tools: Python, SQL, Amazon Web Services

2021 – 2022: Data scientist at Rappi Brasil

Description: Development of user value models and other user related metrics.

Results:

- Development of a custom model for predicting user life time values.
- Visual dashboards with multiple selections and filters for data visualization.

Tools: Python, SQL

2018 – 2018 Data Scientist at Olivia AI, San Francisco

Description: Classification of monetary transactions for a personal finances organization app.

Results:

- Development of custom string distance metric which improved classification results.
- Ensemble model leveraging a stack of classification which included rule-based models as well as machine learning models.

Tools: Python, nodejs

2016 – 2020: Ph.D. in statiscal and Computational Physics

Description: Study of coupled oscillator models and its dynamical properties, such as phase transitions and steady states, and how these properties are affected by different types of connectivity graphs. Supervised by professor Ronald Dickman at UFMG and co-advised by professor Kevin Wood at UMICH.

Results:

- Event-driven simulations of the dynamics between coupled oscillators, which hinted at regions of bi-stability of two steady states for some systems.
- Mathematical description of the dynamics of coupled oscillators on a small-world network. This description effectively interpolated between two previous descriptions for lattice networks and random networks.
- Collaboration with

Tools: C, C++

2015 – 2016: Researcher at Hewlett Packard funded lab at University of Minas Gerais

Description: Research and development under a grant from professor Gilberto Medeiros Ribeiro for a high power near-field microscope. Tasks involved geometrical design for electrical cavities, electrical and motor designs.

Results: Movement system for the microscope sample and the first generations for the resonant cavity operating with a microwave transformer.

Tools: CAD software, workshop

2010 – 2012: Undergraduate scientific initiation

Description: Development of capacitance sensing electronic for measuring atomic clusters inside a vacuum chamber, and electrostatic lenses for selection of clusters by mass. Supervised by professor Varlei Rodrigues at the University of Campinas.

Results: Design and build for a capacitance sensor with high resolution and its data acquisition software. Design and build of an electrostatic lens together with its housing vacuum chamber.

Tools: TCL programing language

2012 – 2014: Volunteer math teacher

Description: Voluntary math classes for people earning below minimum wage wishing to ingress at competitive universities. Taught classes of 15 to 20 people, including adults and adolescents.