Xue Li, Ph.D.

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Summary

Ph.D. in Astrophysics and Cosmology with a strong track record of leading and contributing to impactful research projects. Specializing in data science, machine learning, and AI. 10 years of experience in advanced analytics, statistical modeling, and large-scale data processing. Notable for pioneering the use of gamma-ray burst supernovae as standard candles and leading the groundbreaking discovery of an exotic cosmic phenomenon as a black hole. Recognized for analytical thinking and innovation.

Education

2010-2014: PhD in Astrophysics and Cosmology, Niels Bohr Institute, University of Copenhagen, Denmark

- Pioneered the discovery that gamma-ray burst supernovae can be used as standard candles, enabling astronomers to better understand the expansion of the universe, highlighted by Sky & Telescope Magazine.

2006-2009: MSc in Physics, Dalian University of Technology, China

2002-2006: BSc in Physics, Dalian University of Technology, China

Professional Experience

2022-up to date: Self-employed, Machine Learning Engineer

- Developed and implemented machine learning models for social network analysis and sentiment analysis using Python, TensorFlow, and natural language processing techniques
- Conducted research on censorship analysis and information control strategies using large language models.
- Applied advanced data science techniques including web scraping, machine learning, and natural language processing to analyze social media content.
- Analyzed economic indicators using statistical and mathematical tools to uncover trends and relationships.

2016-2022: **Research Associate, physics department, Tsinghua University, China**

- Conducted cutting-edge astrophysics research, machine learning projects for supernovae classification using TensorFlow and Python
- Supervised students in studies of supernovae classification using machine learning techniques.

2014-2016: Visiting Researcher, Niels Bohr Institute, University of Copenhagen, Denmark

- Collaborated with a global network of astrophysicists, using computational skills to analyze complex datasets.

Selected projects

1. Social Network Analysis of Chinese Social Media

- Developed ML models to analyze censorship patterns and information control strategies.
- Applied advanced causal inference methodologies to measure the effectiveness of various initiatives and their impact on user behavior with Python, TensorFlow, and NLP libraries.
- Paper: A Study of Censorship Analysis of Chinese Social Media with Large Language Models

2. Unveiling the Dynamics of Online Expression - A Study of Chinese Netizen Speech

- Analyzed posts from official Chinese government accounts on social media platforms to understand information control strategies during the Russia-Ukraine conflict.
- Utilized natural language processing and developed novel metrics to quantify censorship intensity and public sentiment with Python, TensorFlow, sentiment analysis libraries.
- Paper: Unveiling China's Information Control Strategies on the Russia-Ukraine War

3. Supernova Classification with ML

- Supervised students in studies of supernovae classification using ML.
- Developed ML models for automated classification of supernovae with TensorFlow, Python, and SQL.

4. Time Series Analysis of AT2018cow: Black Hole Discovery

- Initiated and led a scientific project on the anomalous cosmic phenomenon AT2018cow, where I was the first to discover that AT2018cow was a black hole with quasi-periodic oscillations, significantly advancing astrophysical understanding.
- Designed scientific approach, developed tools for data analysis and modeling with Python, SQL, and Matlab, and presented these pioneered findings at the American Astronomical Meeting in 2022.

5. Diverse Scientific Projects in Data Analysis and Data Science

- Led and contributed to 10+ projects and 20+ scientific papers focused on data analysis and data science in the field of scientific research.

Skills

- **Machine Learning:** TensorFlow, scikit-learn, PyTorch
- **Programming:** Python (TensorFlow, scikit-learn), R, SQL, IDL, Matlab
- **Big Data:** Hadoop, Spark (familiarity)
- **Cloud Platforms:** Microsoft Azure
- **Data Analysis & Visualization:** Data cleaning, wrangling, feature engineering, time series analysis, matplotlib, Power BI
- **Statistics & Probability:** Hypothesis testing, regression analysis, Bayesian statistics

IT Certifications

- TensorFlow Developer Certificate
- Microsoft Certified: Power Platform Solution Architect Expert
- Microsoft Certified: Azure Data Scientist Associate
- Microsoft Certified: Azure AI Engineer Associate
- Microsoft Certified: Power BI Analyst Associate