XIAO PING SONG, PhD

8 years of research experience, 7 years in data science, and over 2 years as a project manager. I lead end-to-end delivery for technical projects that develop metrics and predictive software. My research and teaching focus on applied machine learning and geospatial techniques.

I am keen to work with high-performing teams on solutions that scale quickly and provide value. My track record includes developing use cases for data products, gaining access to exclusive data, building dashboard applications, leading technical workshops, and aligning diverse stakeholders in complex/ambiguous environments.

💼 EMPLOYMENT

2021

Postdoctoral Research Fellow
National University of Singapore, Dept. Architecture — 📍 Singapore

- Secured a 3-year grant for $1.5 mil
- Assembled and led a cross-functional team of experts and government officials to develop sustainability reporting standards across six work streams
- Led the deployment of IoT sensor networks in public housing estates, delivering real-time data with 60% cost savings
- Pioneered new methods to reduce spatial disparities in park access, published in a software journal

2020 | 2022

Postdoctoral Research Fellow
National University of Singapore, Dept. Bio. Sciences — 📍 Singapore

- Developed data pipelines and predictive models to assess the diversity of 1,100 animal species in city planning
- Spearheaded client scoping and training workshops for a data product that delivers biodiversity performance benchmarks, gaining buy-in from senior management
- Secured access to sensitive high-resolution (LiDAR) data and $60,000 funding for satellite images
- Led and trained a non-technical team of five to proficiency in coding best practices, resulting in 8x faster development/validation of models

2016 | 2020

PhD Researcher
ETH Zürich, SEC, Future Cities Laboratory — 📍 Singapore

- Drove initiatives for data sharing and industry talks, leading to the publication of four research papers in leading global journals
- Showcased research at global conferences (e.g., UK, Japan, Switzerland) and won the Three Minute Thesis competition

🎓 EDUCATION

2020

Ph.D. in Architecture (Environmental Design)
National University of Singapore, College of Design and Engineering

- Thesis: Big Data Applications for Urban Greening
- Applied statistical/ML techniques to develop a cost-effective strategy
- for managing trees citywide
- Predicted recreational preferences and crowd behaviour at parks based on social media photos

2016

B.Sc. (Hons) in Life Sciences (Environmental Biology), Minor in Technology Entrepreneurship
National University of Singapore

CONTACT

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- in linkedin.com/in/xpsong
- ◯ github.com/xp-song
- 🎓 scholar.google.com

</> CODE & TOOLS

R / tidyverse / r-spatial / Shiny
Python / numpy
PyTorch / Tensorflow / Keras
Git / GitHub
SQL / PostgreSQL / PostGIS
Shell / Bash
RegEx
HTML / CSS
AWS / Google Cloud
Docker (Containerisation)
Posit / Jupyter / Colab & similar
QGIS / ArcGIS / Google Earth Engine
APIs (REST, GraphQL)
Parallel programming
High performance computing
Unit testing

📈 METHODS & DOMAINS

Metric development (inc. spatial)
Clustering & discriminant analyses
Dimensionality reduction
Feature engineering
Hyperparameter tuning
Bootstrapping
Linear models (inc. GLM)
Mixed effect models
Regularisation / Loss functions
Ensemble models (bagging, boosting)
Deep learning (ANN, CNN)
Data visualization (inc. spatial)
Remote sensing (satellite / LiDAR)
Image processing (inc. spectral)
Location data (e.g., POIs)
IoT / Wireless technologies
Econometrics (e.g., natural capital)
Web scraping / analytics (GA4)
Questionnaire surveys

TEACHING / TRAINING SKILLS

2021 | 2022

Introduction to Git
University workshops on version control and GitHub collaboration
🔗 github.com/xp-song/Intro2R-Git

2019 | 2022

Introduction to R Programming and Statistics
Online and in-person workshops covering a variety of topics in R
🔗 xp-song.github.io/posts/intro2r

2018 | 2020

Analysing Spatial Patterns of the Landscape
Module Co-lecturer, National University of Singapore. Master of
Landscape Architecture: Urban Greening Technologies & Techniques
🔗 xp-song.github.io/posts/intro2r-spatial

2016 | 2020

Weekly Music Classes
Part-time Educator, My Drum School Pte Ltd. Attained Net Promoter
Score of 75 (top 5%); Best Educator of the Quarter twice in 3 years
🔗 instagram.com/p/BzpCir0HQA-

CERTIFICATIONS

2023

Ultimate AWS Certified Solutions Architect Associate
Udemy (SAA-C03)
🔗 UC-c042954-4c12-4601-bc63-8a5b938e2266

AWARDS

2016

SEC-NUS Scholarship
Singapore National Research Foundation

2011

Best Full-time National Serviceman
Officer Cadet School (Midshipmen Wing), Singapore Armed Forces

2009

Jacob Ballas Scholar's Award
Perfect score (six distinctions), GCE 'A' Level Examinations

SOFTWARE

📦 **biodivercity**
Assess the spatial distribution of
urban biodiversity between places,
across time, and into the future

📦 **home2park**
Assess the spatial provision of parks
city-wide

📦 **allometree**
Develop allometric equations for the
size and structure of urban trees