

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.

My experience includes developing use cases for data products, leading technical workshops, and aligning diverse stakeholders in complex and ambiguous environments. I have a track record of gaining access to exclusive data, and securing buy-in from senior executives.

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
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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
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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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 github.com/xp-song

 scholar.google.com

CODE & TOOLS

R / tidyverse / r-spatial / Shiny
Python
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)
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
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2022 • **Introduction to Git**
University workshops on version control and GitHub collaboration
github.com/xp-song/Intro2R-Git
- 2019
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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
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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
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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](https://www.udemy.com/course/ultimate-aws-certified-solutions-architect-associate/)

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

-  **biodiversity**
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