




# 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, Switzerland
    - 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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 [xp-song.github.io](https://xp-song.github.io)

 [linkedin.com/in/xpsong](https://linkedin.com/in/xpsong)

 [github.com/xp-song](https://github.com/xp-song)

 [scholar.google.com](https://scholar.google.com)

## CODE & TOOLS

R / tidyverse / r-spatial / Shiny  
Python / numpy / scikit-learn  
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  
Data visualization (inc. spatial)  
Feature engineering  
Regularisation / Loss functions  
Bootstrapping / Cross validation  
Model diagnostics & debugging  
Linear models (inc. GLM)  
Mixed effect models  
Decision trees / Ensemble models  
Deep learning (ANN, CNN)  
Remote sensing (satellite / LiDAR)  
Image processing (inc. spectral)  
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](https://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](https://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](https://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-](https://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