# Xinyu Guo

xinyug@usc.edu
(314) 680-8961
www.linkedin.com/in/xinyu-guo-5408

## EDUCATION

**University of Southern California,** GPA 3.95/4.0 — Los Angeles, CA
**Doctor of Philosophy, Computational Biology and Bioinformatics** — August 2022 - Current

- Andrew J. Viterbi Fellowship, awarded for outstanding Ph.D. student in computational sciences

**Johns Hopkins University** — Baltimore, MD
**Master of Science, Biostatistics,** GPA 3.97/4.0 — August 2020 - May 2022

- Member of the Delta Omega Public Health Honorary Society

**Washington University in St. Louis** — St. Louis, MO
**Bachelor of Art, Mathematics Major & Computer Science Minor**, GPA 3.89/4.0 — August 2018 - May 2020

- Cum Laude, Dean's List

## TECHNICAL SKILLS

- **Programming languages:**
  R (proficient), Python (proficient), SQL, Java, HTML.
- **Skills:**
  Advanced statistical modeling, machine learning, algorithm development, risk assessment, data scraping, predictive analytics, and data dashboard building.

## EXPERIENCE

**Co-Founder, Legal Patent Copilot**

- Developed an LLM-powered system to enhance patent attorney prior art search processes.
- Implemented sentence transformers for encoding the entire patent database, storing embeddings in a vector database.
- Integrated Retrieval-Augmented Generation (RAG) to ensure efficient, accurate, and sophisticated searches.

**Co-Founder, Intelligent Tennis Coach**

- Designed a computer vision system to analyze tennis training and game videos.
- Developed an object detection and tracking pipeline to extract players' and ball trajectories for statistical analysis.
- Built and trained Hierarchical Contextual Networks for action detection in tennis.
- Fine-tuned LLMs with tennis-specific datasets, enabling personalized coaching insights and conversations.

**Deal Scout, UpHonest Capital**

- Researched and identified potential investment opportunities.
- Actively participated in deal evaluation and investment decision-making processes.

**Lab Member, Statistical Genetics and Genomics Studies**
**Advisor:** Dr. Liang Chen, University of Southern California

- Using statistical and machine learning model to identify disease risk region based on spatial transcriptomics data.
- Analyzed cell cycle phases distributions with single cell RNA-seq data at tissue-specific and cell type-specific level.
- Identified genetic factors of nonsense mediated mRNA decay with downstream regulations.

**Lab Member, Statistical Genetics Studies**
**Advisor:** Dr. Nilanjan Chatterjee & Dr. Diptavo Dutta, Johns Hopkins University

- Developed a cross-tissue subset-based meta-analysis methods to identify a set of potential "active" tissues with improved power.

**Lab Member, Statistical Genomics Studies**
**Advisor:** Dr. Hongkai Ji & Dr. Eneda Toska, Johns Hopkins University

- Built RNA-seq, ChIP-seq, and ATAC-seq data analysis pipeline: Align and map sequence reads to the genome; Implement downstream analysis such as differential analysis, gene set enrichment analysis, and motif analysis.
- Elucidating how transcriptional and epigenetic regulators mediate hormone-driven cancer tumor resistance to therapeutics.

**Research Assistant, Respiratory Failure Prediction**
**Advisor**: Dr. Andrew Michelson, Washington University in St. Louis, Institute for Informatics

- Modeled with lasso and logistic regression to predict respiratory failure probability of COVID-19 tested patients. This model is implemented in the Barnes-Jewish Hospital Electronic Health Record system to early identify patients' risks for respiratory decompensation, facilitating timely resource deployment.

## PAPERS & PUBLICATIONS

- **From G1 to M: a comparative study of methods for identifying cell cycle phases.** *Briefings in Bioinformatics.*
  **Guo, X.**, Chen, L. (doi: https://doi.org/10.1093/bib/bbad517)
- **Cell-autonomous Cxcl1 sustains tolerogenic circuitries and stromal inflammation via neutrophil-derived TNF in pancreatic cancer.** *Cancer Discovery.*
  Bianchi, A., …, **Guo, X.**, …, Merchant, N. (doi: https://doi.org/10.1158/2159-8290.cd-22-1046)
- **Subset-based method for cross-tissue transcriptome-wide association studies improves power and interpretability.** *Human Genetics and Genomics Advances.*
  **Guo, X.**, Chatterjee, N., Dutta, D. (doi: https://doi.org/10.1016/j.xhgg.2024.100283)
- **Transcriptome-and proteome-wide association studies identify genes associated with renal cell carcinoma.** *The American Journal of Human Genetics.*
  Dutta, D, **Guo, X.**, …, Purdue, R. (doi: https://doi.org/10.1016/j.ajhg.2024.07.012)
- **Methylation of the chromatin modifier KMT2D by SMYD2 contributes to therapeutic response in hormone-dependent breast cancer.** *Cell Reports.*
  Blawski, R., …, **Guo, X.**, …, Toska, E. (doi: https://doi.org/10.1016/j.celrep.2024.114174)
- **ERK hyperactivation serves as a unified mechanism of escape in intrinsic and acquired CDK4/6 inhibitor resistance in acral lentiginous melanoma.** *Oncogenes.*
  Jagirdar, K., …, **Guo, X.**, …, Rebecca, V. (doi: https://doi.org/10.1038/s41388-023-02900-6)
- **SMYD2 Regulates Chromatin Modifier KMT2D in ER+/PIK3CA Mutant Breast Cancer.** *Cancer Research.*
  Blawski, R., …, **Guo, X.**, …, Toska, E. (dio: https://doi.org/10.1158/1538-7445.AM2022-2955)
- **The histone methyltransferase KMT2D mediates subtype-specific transcriptional regulation and therapeutic response in prostate cancer.** *Cancer Research.*
  Kittane, S., …, **Guo, X.**, …, Toska, E. (dio: https://doi.org/10.1158/1538-7445.AM2024-1245)

## LEADERSHIP AND COMMUNITY INVOLVEMENTS

**Founder, China EYE Public Welfare** — Shanxi, China — June 2016 – Current

- Founded an NGO with more than 50 people and raised a donation online while holding charity book fairs in schools and parks
- Went to middle schools in impoverished areas and donated 100 brand new desks with many other teaching equipment

## HONORS AND CERTIFICATIONS

- Andrew J. Viterbi Fellowship, awarded to outstanding Ph.D. students in computational science. (August 2023)
- Selected as a member of the Alpha chapter of the Delta Omega Society—Honorary Society in Public Health (May 2022)
- Present at the Second Annual Data Science Workshop at Augusta University (October 2021)
- Poster Presentation in MSSISS at University of Michigan (February 2020)
- Summer Undergraduate Research Award (Summer 2019)
- Poster Presentation in Undergraduate Research Symposium (November 2019)
- Math tutor of Washington University in St. Louis Arts & Science school (August 2019)
- First prize in the 7$^{th}$ Advanced Graphing Technology and Innovation Design Competition (June 2017)
- Outstanding Student Leaders of East China University of Science and Technology (June 2018)
- Professional Certification of Auto CAD Graphing

Patent—Multifunctional Shared Printer [201821510016.7]; Patent—Portable Shared Printer [201821494888.9]