

## Zhao Tang, Ph.D.

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### SUMMARY

- Ph.D. research scientist with 5+ years of experience in interdisciplinary teams from NASA and Saudi Aramco for statistical analysis, track record of scientific accomplishment with 12 publications.
- 4+ years of full-stack Java experience in computer vision, web, and mobile development with solid programming skills and computer science knowledge.

### EDUCATION

#### Georgia Institute of Technology, Atlanta GA

01/2024-05/2025(Expected)

*Master in Computer Science*

#### Rice University, Houston, TX

08/2012-04/2022

*Ph.D. in Chemical and Biomolecular Engineering, GPA 3.63/4.00*

Research Advisor: Prof. Matteo Pasquali

#### Purdue University, West Lafayette, IN

08/2009-05/2012

*BSE with honor degree in Chemical Engineering, GPA 3.76/4.00*

Research Advisor: Prof. Alex Wei

### WORK EXPERIENCES

#### Research scientist at Rice University, Houston, TX

2022/06-Current

#### LabSup: Spring and Hibernate based Lab supplies management system ([github.com/zt5rice/hermes](https://github.com/zt5rice/hermes))

- Built a web application based on **Spring MVC** to support item search and listing (dependency injection, inversion of control, REST API, etc.).
- Implemented security workflow via in-memory and **JDBC** authentication provided by **Spring Security**.
- Utilized **Hibernate** to provide better support for database operations.
- Developed a Spring Web Flow to support item ordering.

#### Super-resolution video tracker for fast-moving and flexible nanoparticles

- Developed automated **image processing** software to track multiple parameters for various complex nanoparticles, such as bending flexible nanorods and nano-sheets.
- Optimized **MATLAB video processing** speed and leveraged parallel computing in the cluster, reducing **video processing time** from 15 hours to 30 minutes.
- This software directly offers methods for 5 high-impact journal papers.

#### Machine learning assisted singled-walled carbon nanotube(SWCNT) Transport in silica pores

- Led an optical team of 5 to design, build and maintain near infrared(NIR) laser fluorescent optical system(microscopy and spectroscopy) to visualize **SWCNT** as oil-marker for extending crude oil mapping to smaller pores beyond current tracers' pore size limit.
- Estimated Hurst exponent, categorize anomalous diffusion type of SWCNT in complex pores developing a convolutional deep neural-network model (**CNN**) in MoNet Architecture with more than 90% accuracy. Results will be presented at [the 2023 AIChE annual meeting](#).

### TECHNICAL SKILLS

- Programming language: Java, JavaScript, MATLAB, SQL, Python, C, Go, FORTRAN
- Web Development: Java Servlet, AngularJS, Node.js, HTML & CSS, React, Ant Design, Material-UI, Android
- Databases and Cloud: MySQL, AWS EC2, Google Cloud

### PROJECTS

#### Around: GCP and React-based Social Networks

- Launched a scalable web service in **Go** to handle user posts and deployed to **Google Cloud** (Google App Engine).
- Used **Elasticsearch** (deployed to GCE) to provide search functions such that users can search recent posts and list personal posts.
- Designed and implemented a social network web application with **React JS**.
- Implemented features for users to create and browse posts.

- Improved the authentication using token-based registration/login/logout flow with **React Router v4** and server-side user authentication with **JWT**.

### **Smart Express: a web application providing drone and robot dispatch solution**

(<https://github.com/zt5rice/Dispatch-Delivery-Management-App>)

- Designed and developed a full-stack web application for users to deliver packages using drones/robots, place an order, and track the delivery.
- Co-led an agile team of 14 members and worked as a front-end engineer in the development process and maintained the product document.
- Created a single-page web application using **React** and **Ant Design**, with **React Router** for page navigation, **React Redux** for global state management, and **Redux-Thunk** for Asynchronous operations.
- Built the Room Database with LiveData & ViewModel to support local cache and offline model.
- Collaborated with team members to perform unit-level testing and integrated frontend and backend.

### **Job+: A Personalized Job Recommendation Engine** (<https://github.com/zt5rice/jobplus>)

- Designed and implemented an interactive web app for users to search and apply for available positions.
- Performed front-end web UI design and implementation using **HTML/CSS/JavaScript**.
- Implemented RESTful APIs using Java servlets, retrieved job descriptions using GitHub API, and stored data in **MySQL**.
- Explored multiple recommendation algorithms and extracted keywords from job descriptions to implement a Content-based algorithm.
- Deployed the service to **AWS EC2**.

### **Twitch+: A Personalized Twitch Resources Recommendation Engine**

- Designed and built a full-stack web application to search Twitch resources (stream/video/clip) and get recommendations.
- Built a web page with a rich + user-friendly experience using **React** and **Ant Design**.
- Implemented RESTful APIs using Java servlets, retrieved natural Twitch resources using Twitch API, and stored data in **MySQL**.
- Support login/logout and favorite collection.
- Explored multiple recommendation algorithms and extracted game information from Twitch resources to implement a Content-based algorithm.
- Deployed the service to **AWS EC2** for better stability.

### **TravelPlanner: A travel path management web application**

- Built a full-stack web application for travelers to plan/customize and save travel paths from points of interest based on **Java Spring MVC** and **Google Maps API**.
- Collaborated with an interdisciplinary team of 9 members as a backend engineer in the development process and maintained the product requirement document.
- Built a responsive web page using **React JavaScript** and **Material-UI**.
- Implemented RESTful APIs of controller, service, and dao using **Spring Boot**, retrieved map resources using **Google Map API**, and stored data in **AWS RDS MySQL**.
- Implemented features for users to generate, visualize, store, and share travel paths.
- Support login/logout and favorite attraction collection.
- Deployed the app to **AWS** for demonstration and supported 200 qps tested by **Apache JMeter**.

## **SELECTED PUBLICATIONS**

- Adnan, M.; Pinnick, R. A.; **Tang, Z.**; Taylor, L. W.; Pamulapati, S. S.; Carfagni, G. R.; Pasquali, M. “*Bending Behavior of CNT Fibers and Their Scaling Laws.*” *Soft Matter* 14 (41), 8284-8292.
- Smith, A. D.; **Tang, Z.**; Pasquali, M.; Martí, A. “*Real-Time Visualization and Dynamics of Boron Nitride Nanotubes Undergoing Brownian Motion.*” *The Journal of Physical Chemistry B* 124 (20), 4185-4192.
- Umezaki, U.; Smith, A. D.; **Tang, Z.**; He, Z.M.S.; Corr, S.; Kolomeisky, A.; Pasquali, M. Martí, A. “*Two-Dimensional Diffusion of Hexagonal Boron Nitride Nanosheets in Aqueous Solution.*” submitted to *ACS nano*.
- **Tang, Z.**; Eichmann, S.L.; Jamali, V.; MacKintosh, F. C.; Pasquali, M. “*Investigating Ergodicity-Broken Rotational Dynamics of SWCNT in Hexagonally Packed Colloidal Pores Via Machine Learning.*” AICHE Annual Meeting 2023 Orlando FL.