

CURRICULUM VITAE

HSI-NIEN TAN

Contact Information

Name: Hsi-Nien Tan
Address: Nashville, TN

Employment History

- 2023 – Present Senior Application Developer at Vanderbilt University Medical Center - Center for Quantitative Sciences, Tennessee, USA
- 2021 – 2023 Application Developer at Vanderbilt University Medical Center - Center for Quantitative Sciences, Tennessee, USA
- 2016 – 2021 Associate Application Developer at Vanderbilt University Medical Center - Center for Quantitative Sciences, Tennessee, USA
- 2015 – 2016 Associate Application Developer at Vanderbilt Center for Quantitative Sciences, Tennessee, USA
- 2015 Associate Application Developer (Vanderbilt Temporary Service) at Vanderbilt Center for Quantitative Sciences, Tennessee, USA
- 2013 – 2014 Project Manager at Hydro-Science and Technology Research Center, Taiwan
- 2011 – 2013 Hydrology Engineer at Hydro-Science and Technology Research Center, Taiwan

Education

- 2010 – 2011 Master in Department of Hydraulic and Ocean Engineering, National Cheng Kung University, Taiwan
- Thesis Title: A study of dominant discharge during the flooding
 - Advisor: Professor Chang-Tai Tsai
- 2004 – 2007 Undergraduate in Department of Hydraulic and Ocean Engineering, National Cheng Kung University, Taiwan

Computer Programming Skills

- Frameworks: Node.js, AngularJS, Angular, jQuery, Ruby on Rails, Bootstrap, RSpec, Mocha/Chai, Sinon
- Programming languages: JavaScript, Python, Perl, Ruby, R, C++, CUDA C/C++, Fortran, CUDA Fortran, Visual Basic, Markdown
- Databases: SQL, MySQL, MongoDB, BigQuery
- Tools / Knowledge: Git, Docker, HTML5, Unit testing, RESTful APIs, REDCap API, Twilio API, USPS API, UPS API, FedEx API, CSS, CI/CD, D3.js, Go, FHIR, Google Cloud Platform, Databricks, Jupyter Notebook, Kubernetes, Jira, Confluence, GitLab, GitHub

Profile

Highly motivated and experienced IT developer with a strong background in software development, research data platforms, and project coordination, supporting large-scale clinical and biomedical datasets. Proven track record of delivering high-quality projects on time. Passionate about automation, innovation, and contributing to the open-source community, with a strong interest in collaborative development and sharing knowledge to drive technological advancements.

- Professional experience: 13 years
- First professional experience: 07-2011
- Significant experience: Web based / programming (9 years); API / programming (9 years); Server / maintenance (6 years); Big Data / monitoring and reporting (3 years); GPU / programming (3 years); Project / specification planning (2 years);

Research Data Platforms – Scale & Scope

- All of Us Research Program (NIH): Data analytics and quality control (QC) for a 626,396-participant national cohort, utilizing Google BigQuery and notebook-based analysis workflows.
- VUMC Synthetic Derivative: Chart review and data validation for researcher-led studies using a 4,146,967-person de-identified clinical database, supported by SQL and Databricks environments.
- Automated reporting and analytics infrastructure supporting 200+ reports per week.

Professional Experiences

Center for Quantitative Sciences (2021-Present)

- Contributing member of the All of Us Research Program (NIH) Data Team, supporting data analytics and quality control (QC) for a national research cohort of 626,396 participants.
- Conducted chart review and data validation for researcher-led studies using the VUMC Synthetic Derivative database (4,146,967 individuals).
- Developed and implemented an automated reporting system, winning the VUMC Department of Biostatistics IT Innovation Award (2022), which:
 - Runs R Markdown or coded reports on a chronological basis
 - Sends reports via email to a whitelist of interested parties
 - Dynamically accepts emails and automatically runs reports on a desired schedule
- Expanded the automated reporting system to process over 200 reports per week, solidifying its position as a critical tool for data analysis and reporting (2024)
- Implemented a REDCap project to collect data for clinical research, including:
 - Electronic consent process
 - Follow-up reminders
 - Coordinator notifications
- Developed a REDCap external support site with:
 - Randomization service
 - Ruby on Rails and microservices architecture
- Led development of a comprehensive REDCap external support site featuring:
 - Randomization service

- Daily survey reminders
- Missing survey reminders
- Daily participant health index monitoring
- Data sync between databases
- Drug delivery tracing
- Real-time dashboard
- Ruby on Rails, USPS/FedEx/UPS/Twilio API, and microservices architecture
- Built a REDCap external support site with:
 - Text message interactive system
 - Ruby on Rails and Twilio API
- Configured REDCap Clinical Data Pull module for capturing medical records through FHIR
- Maintained a dataset check system with:
 - Configuration and data check engine
 - Collaboration with statisticians and programmers
- Coordinated with PIs to:
 - Outline and confirm requirements
 - Clarify details and convert requirements into specifications
 - Utilize Jira and Confluence for communication with developers and QA team
- Maintained legacy projects for urgent issues

Center for Quantitative Sciences (2015 - 2021)

- Created a Ruby on Rails application. Completed complex data structures on database and a large amount of data import interface, flexible dataset support.
- Built a web-based system that can be scheduled to run daily to update the database.
- Applied OOP fundamentals to projects. Created single-page applications in JavaScript in the AngularJS framework as well as HTML, CSS and Bootstrap. Worked with jQuery for JavaScript libraries. Utilized Grunt to automate bundling of modules, JavaScript minify, management/tracking with GitLab Issue Tracking Solution.
- Maintained servers and RESTful APIs with Node.js REST framework. Retrieved and stored database information in MongoDB include unit testing.
- Created a website by Node.js that can generate PDF reports on the server side.
- Generated the form template on Ruby on Rails with REDCap API.

Hydro-Science and Technology Research Center (2011 - 2014)

- Successfully refactored a legacy Fortran application into C, leveraging the NVIDIA CUDA C framework to harness GPU parallel acceleration and achieve a significant performance boost, resulting in a 50-100x reduction in computational time.
- Designed and developed interfaced programs for internal teams, streamlining workflows and improving output reliability and effectiveness, with a focus on enhancing productivity and reducing errors.