Chen Kun Ting

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CURRENT APPOINTMENT

Dec, 2023—Current: Consultant at the Digital Mobility Solutions Division, MSI Global Pte Ltd, Singapore

· Lead backend software development of value checker management system for monitoring and controlling value checkers in the production; develop full-stack web app for monitor and control real-time value checker device status, events, using Angular, and Java Spring Boot, with TCP/IP socket communication, Jasper report framework, and data storage using MySQL.

· Lead backend software development of Rapid Transit System (RTS) for automatic fare collection (AFC) system solutions; develop transit and bank acquirer and transit payment gateway microservices to integrate with Mastercard Payment Gateway Services (MPGS), using Angular (frontend), Java Spring Boot (backend), interactive report framework with Tableau, and data repository using PostgresSQL and stored procedures.

· Experienced in DevOps CI/CD pipeline with Git, Jenkins, Duckers, OpenShift Cloud Platform, Kubenetes, and SonarQube code analysis.

· Research and explore AI tools to automate software designs, documentations, facilitate more effective software communication and collaboration.

· **Publication**:

Sita A Vriend, Sandeep Vidyapu, Amer Rama, **Kun-Ting Chen**, Daniel Weiskopf, "Which Experimental Design is Better Suited for VQA Tasks? Eye Tracking Study on Cognitive Load, Performance, and Gaze Allocations," ACM Symposium on Eye Tracking Research & Applications (**ETRA 2024**)

EDUCATION

Apr 2019—May 2022: Ph.D. in Data Visualization & Immersive Analytics, Faculty of Information Technology, Monash University, Melbourne, Australia

Sep 2007—Jul 2009: M.Sc. in Computer Science and Engineering, National Chiao Tung University, Hsinchu, Taiwan

Sep 2002—Jun 2006: B.Sc. in Computer Science Engineering, Tatung University, Taipei, Taiwan

PROFESSIONAL EXPERIENCE

Strong research professional with a PhD focused on interactive data visualization, network visualization, and visual analytics, with a publication record in top-tier venues in data visualization and human-computer interaction. Developed the open-source toolkit Gazealytics, a sophisticated visual analytics software featured on the popular Geomob podcast (30:07 - 34:05).

Experienced senior software engineer managing AFC software for transportation systems across multiple cities. Skilled in cloud-based software design and development, with significant experience developing and deploying AFC software system-wide in numerous production stations and depots across multiple cities.

Apr 2023 - Nov 2023: Researcher at the Center for Research on Engineering Software Technologies (CREST), Adelaide, Australia

· Drive research and development of visual analytics and machine learning tools for more effective software vulnerability prediction in terms of improved data quality, model accuracy and recall, funded by Cyber Security Cooperative Research Center (CSCRC)
· Develop machine learning algorithms for software vulnerability prediction using TypeScript, D3.js for visualization, Python, scikit-learn, Logistic Regression, Supervised Vector Machine for training models and evaluating model performance
· Develop real-time job management website using React, Python Django, and MySQL, with web sockets for real-time communication, and deployment in AWS
· Conduct interviews with cyber security analysts and developers for requirement analysis and prototype software evaluation

May 2022—Apr 2023: Researcher at Visualization Research Center of Universität Stuttgart (VISUS), Stuttgart, Germany

· Drive the research and development of visual analytics tools for data exploration and data analytics for large and complex eye tracking data.
· Design and develop full-stack web app of a unified visual software, Gazealytics, for eye tracking data analytics, using Nginx, Node.js, P5.js for visual analytics, Python for data processing. (Gazealytics is available at GitHub)
· Conduct interviews with eye tracking domain analysts and developers for requirement analysis and prototype software evaluation
· Co-organized the 7th Workshop on Eye Tracking and Visualization (ETVIS 2023) as a Publicity Chair and International Program Committee (in conjunction with ETRA 2023)
· **Publications**:

1. **Kun-Ting Chen**, Quynh Quang Ngo, Kuno Kurzhals, Kim Marriott, Tim Dwyer, Michael Sedlmair, and Daniel Weiskopf, "Reading Strategies for Graph Visualizations that Wrap Around in Torus Topology," ACM Symposium on Eye Tracking Research & Applications (**ETRA 2023**)
2. **Kun-Ting Chen**, Arnaud Prouzeau, Joshua Langmead, Ryan T Whitelock-Jones, Lee Lawrence, Tim Dwyer, Christophe Hurter, Daniel Weiskopf, and Sarah Goodwin, "Gazealytics: A Unified and Flexible Visual Toolkit for Exploratory and Comparative Gaze Analysis," ACM Symposium on Eye Tracking Research & Applications (**ETRA 2023**)

Apr 2019—Apr 2022: Fully Funded PhD Candidate at Faculty of IT, Monash University, Victoria, Australia

· Research data analysis, interactive visualization and visual analytics tools for networks, time series, geographic data, aimed for automatic algorithms that optimize network visualizations and layouts for enhancing data analysis and comprehension.
· Develop prototype visualizations, algorithms, experimental software using TypeScript, D3.js, R, Python, websites deployed in GitHub page (full list of software prototypes is available in https://kun-ting.github.io/)
· Conduct interviews with more than 350 users using Prolific Academic platform and evaluate software usability and user experience.
· Present and publish research papers in top-tier venues in information visualization and human-computer interaction.
· **Publications**:

1. **Kun-Ting Chen**, Tim Dwyer, Yalong Yang, Benjamin Bach, and Kim Marriott. "GAN'SDA Wrap: Geographic And Network Structured DAta on surfaces that Wrap around," ACM CHI Conference on Human Factors in Computing Systems (**CHI 2022**)
2. **Kun-Ting Chen**, Tim Dwyer, Benjamin Bach, and Kim Marriott. "Rotate or Wrap: Interactive Visualizations of Cyclical Data on Cylindrical or Toroidal Topologies." IEEE Transactions on Visualization and Computer Graphics (**VIS 2021**)
3. **Kun-Ting Chen**, Tim Dwyer, Benjamin Bach, and Kim Marriott. "It's a Wrap: Toroidal Wrapping of Network Visualizations Supports Cluster Understanding Tasks." ACM CHI Conference on Human Factors in Computing Systems (**CHI 2021**)
4. Florian 'Floyd' Mueller, Rohit Khot, Tim Dwyer, Sarah Goodwin, Kim Marriott, Jialin Deng, Han Phan, Jionghao Lin, **Kun-Ting Chen**, Yan Wang. "Data as Delight: Eating data". ACM CHI Conference on Human Factors in Computing Systems (**CHI 2021**)
5. **Kun-Ting Chen**, Tim Dwyer, Kim Marriott, and Benjamin Bach. "DoughNets: Visualizing Networks Using Torus Wrapping". ACM CHI Conference on Human Factors in Computing Systems (**CHI 2020**). p1–11

Sep 2017－Apr 2019: Consultant at Fare System Business Unit, System Development Division, MSI Global Pte Ltd, Singapore

· Device lead / Full-stack developer of full-stack AFC applications for station computer (SC) and monitor and control system (MCS).

· Design and develop full-stack AFC applications for SC and MCS for visualizing, managing real-time fare collection devices status, event sequence across multiple client applications, and control equipment operations, using MQTT, TCP/IP sockets, Windows Forms, Angular platform, Java, reports generation and with ETL, MySQL and stored procedures.

· Develop load test automation in C++ applications and batch scripts for measuring performance and reproducing large-scale message transfer in development environment.

· Analyze and enhanced GUI performance of Windows Forms applications and the MySQL database server.

· Design and develop new SVG-based station layout authoring tools for monitoring real-time equipment status and controlling fare collection devices

· Successfully deploy the software applications system-wide in more than 50 Skytrain stations and depots for BTS.

· Travel across region to stage patches of in-production software in trial and deploy phases; provide technical consultation/solutions to clients.

· Research software visualization tools Visual Studio Code Map/IntelliJIDEA Flow to improve software design and issue discussion, debugging, and collaboration.

Sep 2015－Sep 2017: Senior Software Engineer at Fair system department, Land Transport Authority (LTA), Singapore

· Device lead / Full-stack developer of AFC applications for master depot computing system (MDCS). Developed parameter management, job management, assets management, access control, and monitoring real-time fare collection devices status using ExtJS (web app), Java, C++ (backend services), with MQ, reporting using SSRS, and data repository using MSSQL and stored procedures.

· Design and develop web applications and multi-server applications for monitoring real-time fare collection devices status using technologies such as Java, C++, ExtJS,

MSSQL, MQ, web sockets, MSSQL scripts and shell scripts for CI/CD

· Research technologies such as ExtJs / Angular platform and provide knowledge sharing within the group.

· Skill in agile tools: Scrum, Jira, Trello to manage / update product development process.

Oct 2013－Sep 2015: Software Engineer at Trek 2000 International Ltd. Singapore

· Software developer of a comprehensive Media Broadcasting Ecosystem that is based on cloud computing platform, named Cloudstringers, with Wifi-enabled SD Card project.

· Chief software developer designing and developing Cloud multi-server web applications, using technologies such as Linux shell script to automate backend media files conversion/uploading/downloading, Java Spring MVC, PHP, MySQL.

Oct 2012－Oct 2013: National Service (Private First Class) at Hsinchu Air Base, Taiwan

· Positions and Specialties in the Standing Army of the Taiwanese Armed Forces.

· Speciality: Signaler (7A112A), Rifleman (3A121A)

Jul 2008－Dec 2010 (part time): Assistant Engineer at Computer Vision Lab, National Center for High-Performance Computing (NCHC), Taiwan

· Develop OpenGL Graphical User Interface (GLGUI) applications (using C++) for rich text display, image display used by NCHC.

Aug 2008－Jul 2009 (part time): Assistant Engineer of Safety and Health Technology Center (SAHTECH), Industrial Technology Research Institute (ITRI), Taiwan

· Develop and maintain four SAHTECH's project websites including council of labor affair (CLA), Taiwan Occupational Safety & Health Management System (TOSHMS), SAHTECH official website, and internal employee website.

RESEARCH & PUBLICATIONS

➢ Sita A Vriend, Sandeep Vidyapu, Amer Rama, **Kun-Ting Chen**, Daniel Weiskopf, "Which Experimental Design is Better Suited for VQA Tasks? Eye Tracking Study on Cognitive Load, Performance, and Gaze Allocations," ACM Symposium on Eye Tracking Research & Applications (**ETRA 2024**)

➢ **Kun-Ting Chen**, Quynh Quang Ngo, Kuno Kurzhals, Kim Marriott, Tim Dwyer, Michael Sedlmair, and Daniel Weiskopf, "Reading Strategies for Graph Visualizations that Wrap Around in Torus Topology," ACM Symposium on Eye Tracking Research & Applications (**ETRA 2023**)

➢ **Kun-Ting Chen**, Arnaud Prouzeau, Joshua Langmead, Ryan T Whitelock-Jones, Lee Lawrence, Tim Dwyer, Christophe Hurter, Daniel Weiskopf, and Sarah Goodwin, "Gazealytics: A Unified and Flexible Visual Toolkit for Exploratory and Comparative Gaze Analysis," ACM Symposium on Eye Tracking Research & Applications (**ETRA 2023**)

➢ **Kun-Ting Chen,** "It's a Wrap: Visualizations that Wrap Around Cylindrical,

Toroidal or Spherical Topologies," doctoral dissertation, (**Monash University 2022**)

➢ **Kun-Ting Chen**, Tim Dwyer, Yalong Yang, Benjamin Bach, and Kim Marriott. "GAN'SDA Wrap: Geographic And Network Structured DAta on surfaces that Wrap around," ACM CHI Conference on Human Factors in Computing Systems (**CHI 2022**)

➢ **Kun-Ting Chen**, Tim Dwyer, Benjamin Bach, and Kim Marriott. "Rotate or Wrap: Interactive Visualizations of Cyclical Data on Cylindrical or Toroidal Topologies." IEEE Transactions on Visualization and Computer Graphics (**VIS 2021**)

➢ **Kun-Ting Chen**, Tim Dwyer, Benjamin Bach, and Kim Marriott. "It's a Wrap: Toroidal Wrapping of Network Visualizations Supports Cluster Understanding Tasks." ACM CHI Conference on Human Factors in Computing Systems (**CHI 2021**)

➢ Florian 'Floyd' Mueller, Rohit Khot, Tim Dwyer, Sarah Goodwin, Kim Marriott, Jialin Deng, Han Phan, Jionghao Lin, **Kun-Ting Chen**, Yan Wang. "Data as Delight: Eating data". ACM CHI Conference on Human Factors in Computing Systems (**CHI 2021**)

➢ **Kun-Ting Chen**, Tim Dwyer, Kim Marriott, and Benjamin Bach. "DoughNets: Visualizing Networks Using Torus Wrapping". ACM CHI Conference on Human Factors in Computing Systems (**CHI 2020**). p1–11

➢ **Kun-Ting Chen**, Chien Chen, and Po-Hsiang Wang, "Network Aware Load-Balancing via Parallel VM Migration for Data Centers," in Proc. of the 23rd International Conference on Communications and Networks (**ICCCN 2014**)

➢ Shin-Shiang Lan, **Kun-Ting Chen**, Chien Chen, Jing-Ying Chen, and Rong-Hong Jan, "An Integrated Bus and Taxi Routes for a Mobile Trip Planning System," in Proc. of the IEEE International Conference on e-Business Engineering (**ICEBE 2010**)

➢ Chih-Chiang Yang, **Kun-Ting Chen**, Chien Chen and Jing-Ying Chen, "Market-based Load Balancing for Distributed Heterogeneous Multi-Resource Servers," in Proc. of the 15th IEEE International conference on parallel and distributed systems (**ICPADS 2009**)

➢ **Kun-Ting Chen**, "A Token-based approach of Heterogeneous multi-resource Systems," master's thesis, National Chiao Tung University Library, 2009

MEDIA

➢ My open-source toolkit, Gazealytics, was featured on a popular social media platform - the Geomob podcast in June 2023, on geographical map usability.

TECHNICAL SKILLS

➢ Programming languages: Java Spring Boot, JavaScript, TypeScript, Python, R, SQL, OpenGL, C++, C#

➢ Data visualization frameworks: D3.js, Cola.js, R, Processing, Observable Notebook, React.js, Neo4j

➢ Web development: Angular, Django, Gatsby, Node.js

➢ Database management: PostgresSQL, MSSQL, MySQL, Entity framework

➢ Machine learning: Scikit-Learn, Logistic Regression, Supervised Vector Machine, K Fold, Stratified K Fold Validation, Random Forests

➢ Server management: VMWare ESXI, Red Hat Enterprise Linux, CentOS, Nginx

HONARS & AWARD

➢ Jan 2022: Service certificate as reviewer for premier journal in Computer Science: IEEE Transactions on Visualization and Computer Graphics

➢ Dec 2021: Global Talent Program for a permanent residency in Australia

➢ Nov 2021: **Special Recognitions for one Outstanding Review** at **ACM CHI 2022**

➢ Jun 2019 – Apr 2022: Faculty of Information Technology Research Scholarship

➢ Jun 2019 – Apr 2022: Faculty of Information Technology International Postgraduate Research Scholarship

➢ Apr 2015: Oracle Certified Professional - Java SE 7 Programmer

SUPERVISION

➢ Jul., 2021-Aug., 2022: Co-supervise Monash Faculty of Information Technology research project: "Visual Software for Eye Tracking Data Analysis"

➢ Jun., 2011: Co-supervise undergraduate project in Department of Computer Science & Engineering, National Chiao Tung University: Travel Web server/Android mobile applications of Fleet system using Trip planner web services. The project was entered in European Satellite Navigation Competition (ESNC, 2011)

CHAIRING & ORGANISING CONFERENCE EVENTS

➢ IEEE Visualization Conference (VIS) Student Volunteers Organising Co-chairs (VIS 2023)

➢ The 7th Workshop on Eye Tracking and Visualization (ETVIS 2023) Publicity Chair and International Program Committee (in conjunction with ETRA 2023)

➢ IEEE Visualization Conference (VIS) Student Volunteers Organising Co-chairs (VIS 2022)

COMMITTEE & SERVICES

➢ International Symposium on Visual Information Communication and Interaction (VINCI 2023) International Program Committee

➢ Eurographics conference on visualization (EuroVis 2023) International Program Committee for Posters track

➢ IEEE Visualization Conference (VIS) Student Volunteer/Captain (VIS 2019-2022)

➢ Co-organised SommerFest 2022 for the Institute for Visualization and Interactive Systems (VIS) at University of Stuttgart

➢ EuroVis Conference 2021 Student Volunteer Captain

➢ ACM CHI Conference 2021 Student Volunteer Captain

➢ Convener of Monash Faculty of Information Technology Data Visualization & Immersive Analytics (DVIA) Lab PhD group meeting (2020-2021)

JOURNAL/CONFERENCE PAPER REVIEWER

➢ ACM CHI Conference on Human Factors in Computing Systems (CHI) – 2022, (CHI Late breaking work) – 2021, 2022, 2025

➢ ACM International Conference on Mobile Human-Computer Interaction (MobileHCI) – 2022
➢ ACM Symposium on Eye Tracking Research & Application (ETRA) – 2022, 2024
➢ China Visualization and Visual Analytics Conference (ChinaVis) – 2021, 2022
➢ Eurographics conference on visualization (EuroVis) – 2023, 2024
➢ IEEE Computer Graphics and Applications (CG&A/journal) – 2023
➢ IEEE Conference on Virtual Reality and 3D User Interfaces (IEEE VR) – 2022, 2023
➢ IEEE International Symposium on Mixed and Augmented Reality (ISMAR) – 2021, 2022, journal – 2023, 2024
➢ IEEE Pacific Visualization Symposium (PacificVis) – 2022, 2023
➢ IEEE Transactions on Visualization and Computer Graphics (TVCG/journal) – 2021, 2022, 2024
➢ IEEE Visualization Conference (VIS) – 2021-2023
➢ International Symposium on Graph Drawing and Network Visualization (GD) - 2021
➢ International Symposium on Visual Information Communication and Interaction (VINCI 2023) - 2023
➢ Visual Informatics (Elsevier journal)- 2021
➢ Visualization in Data Science (VDS) - 2021

TEACHING

➢ 2022 Winter semester: Information Visualization & Visual Analytics (teaching & tutoring)
➢ 2011: Vehicular Mobile Commerce with Android Platform: Information and Communication technology (ICT) project in National Chiao Tung University, sponsored by **Ministry of Education**, Taiwan: Provide lab tutorials of software development of Android mobile applications, Java web server applications, Java Servlet, JDBC, XML, JQuery, AJAX, and Google API using Trip planner web services to provide better routes in Taipei city based on criteria of traveling time, budget, and walk distance
➢ 2010: VLSI programming (National Chiao Tung University, Taiwan)
➢ 2009: C++ Programming (National Chiao Tung University, Taiwan)
➢ 2008: C Programming (National Chiao Tung University, Taiwan)