

Bryce Bible

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<http://Bryce.Bible/> Languages: English (native), Japanese (advanced), Esperanto (fluent)

RESEARCH SUMMARY

Computer Science PhD student specializing in computer vision, human-robot interaction, virtual reality, AI agents, and applied intelligent systems, with a strong Japan-focused research and cultural engagement background. Research spans multimodal scenic visibility forecasting, assistive technologies for dementia care, social robotics, and culturally grounded human-centered computing. Experienced in building full-stack research prototypes across machine learning, VR/AR, robotics, cloud infrastructure, data pipelines, and interactive media.

EDUCATION

University of Tennessee Knoxville, PhD in Computer Science

Teaching and research focus in computing pedagogy and AI systems.

Pursuing PhD: Summer 2024 - Present

MS Degree: Spring 2022 - Spring 2024

BS Degree, Magna Cum Laude, Japanese Minor: Aug 2017 - Dec 2021

AI emphasis: machine learning, data systems, and research-to-production translation.

Kansai Gaidai University, Japan, Japanese Studies

Jan 2021 - 2023

EXPERIENCE

Graduate Research Assistant, University of Tennessee 2022–Present

- Delivered applied AI and software prototypes with interdisciplinary teams, translating research outcomes into practical demonstrations.
- Built and evaluated applied AI systems spanning multimodal perception, assistive robotics, and VR-based dementia-care workflows with cross-functional stakeholders.
- Served in the SMART Lab under Dr. Xiaopeng Zhao (2022–2025) until his departure from the university, and continued projects in the AICIP Lab under Dr. Hairong Qi (2025–).
- Contributed to ACTinVR (elder safety), EASIER (environmental risk alerts), MUSICARE-VR (AI-enhanced dementia care), FujiView (Scenic Visibility Forecasting). Conducted collaborative research and public demos (Boston, Kentucky, Tennessee).
- Co-led a study abroad program to Japan with Dr. Noriko Horiguchi (UTK MFLL Japanese), officially sponsored by the University of Tennessee's Programs Abroad Office. Assisted with logistics, instruction, and cross-cultural research discussions for the month-long academic trip across Kobe and Tokyo.
- Organised and led research trip to Japan through the Tennessee Louis Stokes Alliance for Minority Participation (TLSAMP) grant on behalf of Dr. Xiaopeng Zhao. Mentored two undergraduate students in conducting AI and robotics field studies, organized institutional visits and presentations, and co-authored the team's final research report.

Intercultural Engagement Program, Kansai Gaidai University, Japan

Jan–Aug 2021

SKILLS

Technical Skills

AI/ML: PyTorch, TensorFlow/Keras, YOLO, multimodal fusion, reinforcement learning, computer vision, model evaluation, dataset construction, data-labeling pipelines, local model training/fine-tuning, LLM-based AI agents.

AI Systems & Agents: OpenAI API, Gemini, AI-agent architecture, tool-using agents, MCP servers, AI integration in Unity/Unreal applications, research prototype development.

Software & Cloud: Python, JavaScript, C++, C#, Java, PHP, MySQL, Flask, REST APIs, Firebase Auth, Firestore, Google Cloud Platform, Cloud Run, Git.

Interactive Media & XR: Unreal Engine 5, Unity, Godot, VR/AR development, VRChat SDK/Udon, networked multiplayer prototypes, Android development.

Robotics & HRI: SoftBank Pepper SDK, social robotics, human-robot interaction, assistive robotics, ROS basics, Unitree quadrupeds.

3D / Creative Production: Blender modeling, texturing, Geometry Nodes, Blender add-on/plugin development, Substance suite, Adobe Creative Cloud, 3D printing, game asset development, audio production.

Teaching & Leadership: Peer mentoring, project coaching, cross-cultural instruction, technical presentation

Industry Focus: End-to-end

- Team leader for the Intercultural Engagement Language Learning and Broadcasting Team; coordinated cross-cultural media projects between Japanese and international students.
- Overall Project Manager on the Project Manager Team; oversaw scheduling, communication, and deliverables across student teams.
- Mentor to Kansai Gaidai College students via the Service Learning Program; supported first-year students in skill development and cultural adjustment.

COSC Senior Design Mentor / Sponsor, University of Tennessee, Knoxville 2022–2023

- Sponsored and mentored a self-initiated Computer Science (COSC) senior design team; provided technical guidance, feedback, and project resources.
- Faculty-appointed coach for a second COSC team; facilitated weekly meetings, milestones, and deliverable revisions.
- Nominated to mentor a third COSC team for the 2025-2026 year focusing on Japanese handwriting recognition hardware.
- Helped integrate software engineering practices with applied HRI/HCI development.

Freelance Software Development, Tennessee 2010–Present

- Built server-side and client-side software for web, mobile, and desktop platforms.
- Developed 30+ Android applications with more than 300,000 combined downloads.
- Collaborated with startups, research labs, and local businesses on applied software projects.
- Built VR and interactive media prototypes using Unity, C#, Udon, and related tools.

SELECTED PROJECTS

FujiView 2025–Present
Multimodal scenic visibility forecasting platform for Mount Fuji

- Developed a multimodal computer vision system for predicting Mount Fuji scenic visibility using webcam imagery, weather data, and late-fusion modeling; accepted to WACV 2026.
- Built large-scale image collection, labeling, training, and evaluation workflows using 318,000+ webcam images and an estimated 415,000+ associated weather records.
- Extended toward public-facing tourism and environmental sensing applications, including web/mobile interfaces, cloud deployment planning, and field camera deployment strategy.
- Developing commercialization pathways under Tanuki Inc., targeting tourism-facing scenic visibility prediction and embedded display prototypes for hotels and visitor centers.

MUSICARE-VR / Conductor AI 2023–Present
AI-enhanced virtual reality music intervention system for dementia care

- Designed the Conductor AI architecture for adaptive music-based intervention, integrating participant biometrics, activity state, BPM, session timing, and comfort estimation.

product development, rapid prototyping, cloud-backed app delivery

Industry-AI Focus: Multimodal AI systems, model integration in VR/robotics workflows, applied LLM tooling

Creative Tech: VRChat world/avatar development, fandom media production, community platform engineering

GRANTS, AWARDS & HONORS

Graduate Student Research Award (GSRA), University of Tennessee

Received Winter 2025 competitive research funding for FujiView, a multimodal computer vision project for scenic visibility prediction and tourism-oriented environmental sensing.

TLSAMP Research Travel Grant, Tennessee

Louis Stokes Alliance for Minority Participation
Organized and led a Japan-based AI and robotics research trip; mentored two undergraduate students, coordinated institutional visits, and co-authored the final research report.

Digital Japanese Ambassador, UTK Japanese Department

Selected to represent and share Japanese culture with the Tennessee community through digital outreach.

Kakehashi Project, Japanese Ministry of Foreign Affairs

Served as a cultural ambassador to Japan as part of a UTK delegation in partnership with Japan's Ministry of Foreign Affairs.

Kansai Gaidai Global Ambassador Award

Recognized for outstanding international student contributions during study

- Developed reinforcement-learning and AI-agent frameworks for selecting and adapting VR activities such as singing, dancing, and metronome-based interaction.
- Contributed to Unreal Engine VR implementation, biometric data pipelines, and research framing for AI-assisted dementia care.

EASIER Air Alert Platform 2022–2024

Distributed air-quality monitoring and alert system for at-risk homes

- Designed a distributed environmental sensing and alert platform for monitoring indoor air-quality risks in vulnerable households.
- Developed system architecture, implementation strategy, and evaluation approach for master's thesis research and CHASE 2023 publication.

Pepper Robotics and HRI Systems 2022–2025

Social robotics applications for research, public demos, and assistive interaction

- Developed and maintained applications for SoftBank Pepper robots, including interaction modules for music intervention, quizzes, memory games, and public demonstrations.
- Contributed to human-robot interaction systems involving social robots, AI agents, and assistive-care scenarios across multiple research projects.

Pesternote.com 2012–2017

Microblogging social network and online community platform

- Founded, owned, and led development of a microblogging social network that reached approximately 40,000 users at its peak.
- Built and deployed platform features using PHP, JavaScript, and ActionScript 3.
- Managed a distributed team of programmers and moderators supporting development, community operations, and user safety.

StuckCast

Collaborative Homestuck fandom podcast, music, and audio documentary project

- Co-developed a long-running fandom media project producing character podcasts, original fan music, and an audio documentary retrospective on the Homestuck fandom.
- Coordinated remote collaboration with international voice actors, musicians, writers, and editors, including Kira Buckland, known for roles such as 2B in *NieR:Automata*.
- Contributed to audio production, creative direction, community coordination, and digital fan-culture documentation.

abroad in Japan.

EURCA Research Conference, University of Tennessee

Received Arts & Sciences Award of Excellence and OURF Bronze Overall for research on e-learning and language instruction during the COVID-19 pandemic.

UTK Japanese Speech Contest, University of Tennessee

First Place, Advanced Category.

PUBLICATIONS & PRESENTATIONS

Peer-Reviewed

1. **Bible, B.**, Hasnaeen, N., & Qi, H. (2026). *FujiView: Multimodal Late-Fusion for Predicting Scenic Visibility*. *Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*, pp. 5653–5661.
2. **Bible, B.**, Tonn, B. E., Kintziger, K., Ellis, K., First, J., Humphrey, L., Rose, E., & Zhao, X. (2023). Poster: Affordable Automatic Air Quality Monitoring System for At-Risk Homes. *Proceedings of the*

8th ACM/IEEE Int'l Conf. on Connected Health: Applications, Systems and Engineering Technologies (CHASE '23), pp. 211–213.
doi:10.1145/3580252.3589419

Preprints

1. Yuan, F., Hasnaeen, N., Zhang, R., **Bible, B.**, Taylor, J. R., Qi, H., Yao, F., & Zhao, X. (2025). Integrating Reinforcement Learning and AI Agents for Adaptive Robotic Interaction and Assistance in Dementia Care. *arXiv preprint arXiv:2501.17206*.

Thesis

1. **Bible, B.** (2024). *EASIER Air Alert Platform: A Design and Approach to Creating a Distributed Air Quality Monitoring and Alert System*. Master's Thesis, University of Tennessee, Knoxville. TRACE: utk_gradthes/11366

Conference Posters, Talks & Demos

- **Integrating Reinforcement Learning and AI Agents for Adaptive Robotic Assistance in Dementia Care**. Poster, IEEE-EMBS International Conference on Biomedical and Health Informatics (BHI 2025), Oct 26–29 2025, Georgia Institute of Technology, Atlanta, GA. *(Accepted 1-page abstract; eligible for rapid-fire oral presentation.)*
- **MUSICARE-VR: An AI-Enhanced Music Intervention in Virtual Reality System for Persons with Dementia**. Morris, T., **Bible, B.**, Petrovsky, D., & Zhao, X. Poster, A2 Symposium (PennAITech AD/ADRD Focus Pilot Core), 2025, Boston, MA. Poster PDF
- **Elders Alert System About Imminent Environmental Risks (EASIER)**. Humphrey, L.; Kintziger, K.; Tonn, B. E.; Augustine, J. D.; **Bible, B.** (speaker panel). Talk, National Home Performance Conference (NHPC 2024), Apr 11 2024. Session: IAQ & Healthy Homes. Session page
- **EASIER Poster** (listed co-author). Indoor Air 2024 (ISIAQ), Honolulu, HI, July 7–11 2024. Conference program
- Yuan, F., **Bible, B.**, & Zhao, X. (2024). **Advancing Dementia Care: AI Simulations in Managing Everyday Challenges**. *Alzheimer's & Dementia*, 20, e093188. Presented at the Alzheimer's Association International Conference (AAIC 2024), Philadelphia, PA, July 28–Aug 1 2024. Abstracts archive
- **Sustainable Mentoring Networks: Towards Deeper Learning in a Foreign Language Classroom**. Gallmeier, M., Sczesni, U., Blackburn, N., Bowen, J., & **Bible, B.** Demonstration/Presentation (Zoom), University of Tennessee, Knoxville. Moderator: Renee D'Elia-Zunino (University of Tennessee, Knoxville). Focus: Development of a peer-mentoring program connecting upper-level students with first- and second-year language courses through experiential learning.

Work in Progress & Submissions

- **Bible, B.** (et al., anonymous for review). *MUSICARE-VR: An AI-Enhanced Virtual-Reality System for Music Intervention and Alzheimer's Care (Conductor AI)*. Preprint.

TEACHING, MENTORSHIP & CROSS-CULTURAL ENGAGEMENT

UTK Japanese Language Peer Mentor Fall 2020–Fall 2021
Organized weekly sessions to support first-semester Japanese students at the University of Tennessee, providing language practice and mentorship.

Japanese Table Facilitator, UTK Language Program 2019–2021
Led weekly Japanese conversation sessions fostering cross-cultural exchange and language acquisition; engaged both heritage and beginner learners.

Kansai Gaidai College Service Learning Mentor Summer 2021
Mentored first-year Japanese students in video production, supporting skill development through hands-on media projects.

Engaging Students with Peer Mentoring and Discord Spring 2021
Researched Discord-based peer mentoring and e-learning practices for Japanese language instruction during the COVID-19 pandemic. Developed a digital engagement model associated with 2–4× growth in UTK Japanese minor enrollment; presented findings at the UTK Innovative Teaching and Learning Conference and received EURECA research awards.

JAPAN & CROSS-CULTURAL ENGAGEMENT

- Advanced Japanese-language background through UTK Japanese minor, Kansai Gaidai University study abroad, and N1-level coursework.
- Served as a Kakehashi Project cultural ambassador through Japan's Ministry of Foreign Affairs and as a Digital Japanese Ambassador for UTK.
- Co-led and organized Japan-based academic travel, including UTK study abroad programming and TLSAMP-funded AI/robotics research travel.
- Developed Japan-related research and software projects, including FujiView, Japanese-language learning tools, and international education/event platforms.

CREATIVE TECHNOLOGY, XR & DIGITAL MEDIA

VRChat Worlds, 3D Assets, and Virtual Market Development
Created VRChat worlds and digital assets using Unity, Blender, Substance, and VRChat SDK/Udon. Developed and sold virtual assets on BOOTH with hundreds of units sold, participated as a vendor at Virtual Market, and created a VRChat world featured in *PC Gamer* Magazine.

Game, Modding, and Interactive Media Development
Developed interactive software and game-adjacent projects using Unity, Unreal Engine, Godot, JavaScript, and custom tooling. Experience includes Minecraft mod/datapack creation, 3D asset workflows, real-time interaction systems, and AI-enhanced interactive prototypes.

StuckCast
Collaborative Homestuck fandom media project producing character podcasts, original fan music, and an audio documentary retrospective.

Coordinated remote collaboration with international voice actors, musicians, writers, and editors, including Kira Buckland, known for roles such as 2B in *NieR:Automata*.

ENTREPRENEURIAL

Founder, Tanuki Inc.

Developing commercialization pathways for FujiView, including tourism-facing scenic visibility prediction, environmental sensing deployments, and embedded display prototypes for hotels and visitor centers.