Jacob (Hanjie) Shen

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EXPERIENCE

- **SonderMind** — Remote/Denver, CO
  Senior Applied Scientist — *Mar 2023 - Present*
  - Spearheaded the design and development of an internal AI platform leveraging OpenAI's GPT models, featuring a custom Retrieval Augmented Generation (RAG) system; Engineered seamless integration with MongoDB and PostgreSQL to enhance LLM responses with structured, domain-specific data.
  - Architected an innovative AI-driven paid search optimization system integrating LLMs for ad keyword generation, Reinforcement Learning for bid optimization, and a topic-based predictive model for evaluation; Resulted in a 35% increase in marketing ROI through improved ad placements and data-driven keyword strategies.
  - Developed and deployed a client-provider recommendation system leveraging collaborative filtering and NLP techniques to match patients with therapists based on historical success rates and personal preferences, resulting in a 25% improvement in initial therapy session success rates.
  - Pioneered the development of tooling for continuous, reproducible, and automated deployment of Machine Learning (ML) models and services via AWS, employing CI/CD pipelines, Docker containers, and Kubernetes for scalable and efficient ML operations.

- **Mindstrong** (acquired by SonderMind) — Remote/San Francisco, CA
  Senior Applied Scientist — *May 2022 - Mar 2023*
  - Researched and deployed advanced Machine Learning algorithms to enhance Behavioral Healthcare Technology Services, leading to the implementation of personalized, measurement-based care frameworks.
  - Developed a cutting-edge personalized recommendation system for optimizing the content library based on patient clinical symptom profiles using clustering and collaborative filtering techniques.
  - Designed and deployed a Model-Assisted Behavioral Healthcare system, integrating predictive models with clinical decision-making processes to enhance session efficiency and patient triage.

- **Fred Hutchinson Cancer Center** — Seattle, WA
  Senior Research Statistician — *Nov 2018 - Apr 2022*
  - Led the application of advanced statistical and machine learning techniques to longitudinally assess patient data from clinical trials, fitness tracking data, and electronic health records, improved patient outcome prediction accuracy.
  - Developed automated machine learning pipelines for robust data preprocessing and feature extraction, facilitating the lab's transition from purely experimental research to incorporating computational techniques.

- **UC San Diego Health** — La Jolla, CA
  Statistician / Research Manager — *Sep 2015 - Oct 2018*
  - Headed the statistics unit within the Head & Neck Clinical and Translational Research Lab, driving the strategic application of statistical analyses in clinical research, resulting in the publication of research papers.
  - Implemented machine learning algorithms and data visualization techniques using R and Python to analyze medical image data and large-scale clinical trial data, yielding critical insights for clinical decision-making, leading to the improvement in treatment plans.
  - Authored research manuscripts and effectively communicated complex statistical findings to a diverse range of stakeholders, enhancing the impact and reach of research outcomes.

EDUCATION

- **University of California San Diego** — La Jolla, CA
  M.S. in Statistics / Ph.D. in Biostatistics (not completed) — *2018*
- **Xiamen University** — Xiamen, China
  B.S. in Computational Mathematics — *2013*

SKILLS

- **Languages & Tools**: Python, R, SQL, Java, Bash, AWS (SageMaker, EC2), PyTorch, Tensorflow, Docker, Kubernetes, Git/Github

- **Expertise**: Experimental Methods, Bayesian Statistics, Reinforcement Learning, Deep Learning, Anomaly Detection, LLM Applications

PUBLICATIONS

- Knights J, **Shen H** *et al.* **Association of Smartphone Usage Patterns with Sleep and Mental Health Symptoms in a Clinical Cohort Receiving Virtual Behavioral Care: A Retrospective Study**. *SLEEP Advances*, zpad027, 2023.

- Knights J, Bangieva V, Passoni M, Donegan M, **Shen H** *et al.* **A Framework for Precision "Dosing" of Mental Healthcare Services: Algorithm Development and Clinical Pilot**. *International Journal of Mental Health Systems*, 17(1), 21, 2023.

- Ueland K, Sanchez SC, Rillamas-Sun E, **Shen H** *et al.* **A Digital Health Intervention to Improve Nutrition and Physical Activity in Breast Cancer Survivors: Rationale and Design of the Cook and Move for Your Life pilot and Feasibility Randomized Controlled Trial**. *Contemporary Clinical Trials*, 123, p.106993, 2022.

- Kwan ML, Cheng RK, Iribarren C, **Shen H** *et al.* **Risk of Heart Failure with Preserved versus Reduced Ejection Fraction in Women with Breast Cancer**. *Breast Cancer Research and Treatment*, 1-7, 2022.

- Marín-Chollom AM, Hale C, Koch P, Gaffney AO, Contento I, **Shen H** *et al.* **Cognitive Functioning and Health in Hispanic/Latina Breast Cancer Survivors**. *Journal of Immigrant and Minority Health*, 1-8, 2021.

- Zakeri K *et al.* (including **Shen H**). **Predictive Classifier for Intensive Treatment of Head and Neck Cancer**. *Cancer*, 126(24), 5263-5273, 2020.

- **Shen H**, Jeong JH, Mell LK. **Proportional Relative Hazards Model for Competing Risks Data**. *medRxiv*, 2020.

- Vitzthum LK, Park H, Zakeri K, Bryant AK, Feng C, **Shen H** *et al.* **Selection of Head and Neck Cancer Patients for Intensive Therapy**. *International Journal of Radiation Oncology* Biology* Physics*, 106(1), 157-166, 2020.

- Mell LK, **Shen H** *et al.* **Nomogram to Predict the Benefit of Intensive Treatment for Locoregionally Advanced Head and Neck Cancer**. *Clinical Cancer Research*, 25(23), 7078-7088, 2019.

- Park A, Alabaster A, **Shen H** *et al.* **Undertreatment of Women with Locoregionally Advanced Head and Neck Cancer**. *Cancer*, 125(17), 3033-3039, 2019.

- Green G, Kim E, Carmona R, **Shen H** *et al.* **Incidence of Long-Term Esophageal Dilation With Various Treatment Approaches in the Older Head and Neck Cancer Population**. *Frontiers in oncology*, 8, 466, 2018.

- Zakeri K *et al.* (including **Shen H**). **Predictor of Effectiveness of Treatment Intensification on Overall Survival in Head and Neck Cancer (HNC)**. *Annals of Oncology*, 29, viii375-viii376, 2018.

- Vitzthum LK *et al.* (including **Shen H**). **Comparison of Comorbidity and Frailty Indices in Patients with Head and Neck Cancer Using an Online Tool**. *JCO clinical cancer informatics*, 2, 1-9, 2018.

- Bryant AK, Vitzthum LK, Zakeri K, **Shen H** *et al.* **Prognostic Role of p16 in Non-oropharyngeal Head and Neck Cancer**. *International Journal of Radiation Oncology* Biology* Physics*, 100(5), 1319, 2018.

- Zakeri K, Panjwani N, Carmona R, **Shen H** *et al.* **Generalized Competing Event Models Can Reduce Cost and Duration of Cancer Clinical Trials**. *JCO Clinical Cancer Informatics*, 2, 1-12, 2018.

- Mell LK, Zhang Q, **Shen H** *et al.* **Generalized Competing Event Regression to Stratify Head and Neck Cancer Patients: Secondary Analysis of NRG Oncology RTOG 9003, 0129, and 0522**. *International Journal of Radiation Oncology* Biology* Physics*, 99(2), S236-S237, 2017.

- Vitzthum LK, Noticewala SS, Hines P, Zakeri K, Nguyen C, **Shen H** *et al.* **A Web-Based Tool to Compare Comorbidity Models and Geriatric Risk-Assessment in Head and Neck Cancer Patients**. *International Journal of Radiation Oncology* Biology* Physics*, 99(2), E379, 2017.

- Carmona R *et al.* (including **Shen H**) **Improved Method to Stratify Elderly Patients With Cancer at Risk for Competing Events**. *Journal of Clinical Oncology*, 34(11), 1270-1277, 2016.