Jacob (Hanjie) Shen

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EXPERIENCE

- **SonderMind** — Remote/Denver, CO
  Senior Applied Scientist — *Mar 2023 - Present*
  - Researched and deployed advanced Machine Learning (ML) algorithms to enhance Behavioral Healthcare Technology Services, leading to the implementation of personalized, measurement-based care frameworks.
  - Led a project using GPT with a custom reinforcement learning framework to enhance online advertising effectiveness and optimize paid search strategies, resulting in a notable increase in marketing ROI through optimized ad placements and keyword bidding strategies
  - Developed and deployed a client-provider recommendation system to match patients with the most suitable therapists based on historical success rates and personal preferences, which enhanced patient engagement and improved the success rate of initial therapy sessions.
  - Pioneered the development of tooling for continuous, reproducible, and automated deployment of 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*
  - Developed a cutting-edge personalized recommendation system for optimizing the content library based on patient clinical symptom profiles using clustering and collaborative filtering techniques.
  - Developed a robust anomaly detection framework to enhance the monitoring of patients' smartphone usage data and improve therapy efficiency.
  - 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, advanced patient outcome predictions and therapy customization.
  - 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.
  - Implemented machine learning algorithms and data visualization techniques to analyze medical image data and large-scale clinical trial data, yielding critical insights for clinical decision-making.
  - 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 (Hypothesis Testing, Multi-Armed Bandit), Bayesian Statistics, Reinforcement Learning, Deep Learning, Generative Modeling

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.