



## Sulaiman Somani

- Affiliate, Department Funds
- Fellow in Medicine - Med/Cardiovascular Medicine

### Bio

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#### BIO

Born in India, Sulaiman moved to the US at an early age and grew up in rural Georgia. He earned his B.S. in Chemical and Biomolecular Engineering from the Georgia Institute of Technology, graduating summa cum laude. He then enrolled in medical school at Mount Sinai, during which time he took a two-year leave to co-found and lead product development for Monogram Orthopedics, a startup that focuses on improving outcomes following hip and knee replacements by generating 3D-printed, patient-specific implants from CT scans, work which has resulted in 9 patents being filed, FDA 510(k) clearance, and the company having IPO'd in 2023 and acquired by Zimmer Biomet in July 2025.

Upon his return to medical school, he fell in love with Internal Medicine and married his experience in computer vision with new interest in Cardiology by developing algorithms to improve disease diagnostics from electrocardiogram waveforms. He matched at Stanford for residency in 2021, where he continued his passion for Internal Medicine and Cardiology. As a PGY-2, he was a winner of the peer-selected Wolfsohn Award for Outstanding Performance in Internal Medicine, the peer-nominated Best Clinical Teaching by a Medicine Resident Award, and the Award for Professionalism As A Member Of The House Staff in successive years. He has continued to publish AI-related research under the mentorship of Fatima Rodriguez, where he developed algorithms to understand public behaviors around key cardiovascular topics using social media data, earning the Young Investigator Award by the American College of Cardiology. He was then chosen as one of the four Chief Residents for the Stanford Medicine Internal Medicine residency program before starting his Cardiovascular Disease fellowship at Stanford, which he is currently enrolled in. He hopes to pursue a career in Cardiac Electrophysiology, with a research focus on AI, medical device, and digital health research.

#### INSTITUTE AFFILIATIONS

- Member (Postdoc), Cardiovascular Institute

#### PROFESSIONAL EDUCATION

- Board Certification, American Board of Internal Medicine , Internal Medicine (2024)
- Residency, Stanford Medicine , Internal Medicine (2024)
- MD, Icahn School of Medicine at Mount Sinai (2021)
- BS, Georgia Institute of Technology , Chemical and Biomolecular Engineering (2015)

#### PATENTS

- Sulaiman Somani. "United States Patent 12,303,393 Custom hip design and insertability analysis", Icahn School of Medicine at Mount Sinai, May 20, 2025
- Douglas B. Unis, Sulaiman Somani, Anthony B. Costa. "United States Patent 10,945,848 Apparatus, method and system for providing customizable bone implants", Icahn School of Medicine at Mount Sinai, Mar 16, 2021

## Research & Scholarship

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### CURRENT RESEARCH AND SCHOLARLY INTERESTS

Sulaiman Somani is passionate about harnessing the power of cardiovascular signals (e.g., electrocardiograms) and large clinical data (e.g., unstructured like clinical notes) with artificial intelligence to create digital health tools to explain important research questions in and develop digital health tools for prevalent problems in Preventive Cardiology and Cardiac Electrophysiology, particularly around atrial fibrillation.

### Publications

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#### PUBLICATIONS

- **A deep learning phenome wide association study of the electrocardiogram.** *European heart journal. Digital health*  
Hughes, J. W., Theurer, J., Vukadinovic, M., Rogers, A. J., Somani, S., Kang, G., Ghazizadeh, Z., O'Sullivan, J. W., Jain, S. S., Gomes, B., Salerno, M., Ashley, E., Zou, et al  
2025; 6 (4): 595-607
- **A deep learning phenome wide association study of the electrocardiogram** *EUROPEAN HEART JOURNAL - DIGITAL HEALTH*  
Hughes, J., Theurer, J., Vukadinovic, M., Rogers, A. J., Somani, S., Kang, G., Ghazizadeh, Z., O'Sullivan, J. W., Jain, S. S., Gomes, B., Salerno, M., Ashley, E., Zou, et al  
2025
- **Understanding Reasons for Oral Anticoagulation Nonprescription in Atrial Fibrillation Using Large Language Models.** *Journal of the American Heart Association*  
Somani, S., Kim, D. D., Perez-Guerrero, E., Ngo, S., Seto, T., Al-Kindi, S., Hernandez-Boussard, T., Rodriguez, F.  
2025: e040419
- **Novel Domain Knowledge-Encoding Algorithm Enables Label-Efficient Deep Learning for Cardiac CT Segmentation to Guide Atrial Fibrillation Treatment in a Pilot Dataset.** *Diagnostics (Basel, Switzerland)*  
Ganesan, P., Feng, R., Deb, B., Tjong, F. V., Rogers, A. J., Ruipérez-Campillo, S., Somani, S., Clopton, P., Baykaner, T., Rodrigo, M., Zou, J., Haddad, F., Zaharia, et al  
2024; 14 (14)
- **Using large language models to assess public perceptions around glucagon-like peptide-1 receptor agonists on social media.** *Communications medicine*  
Somani, S., Jain, S. S., Sarraju, A., Sandhu, A. T., Hernandez-Boussard, T., Rodriguez, F.  
2024; 4 (1): 137
- **Simple models vs. deep learning in detecting low ejection fraction from the electrocardiogram.** *European heart journal. Digital health*  
Hughes, J. W., Somani, S., Elias, P., Tooley, J., Rogers, A. J., Poterucha, T., Haggerty, C. M., Salerno, M., Ouyang, D., Ashley, E., Zou, J., Perez, M. V.  
2024; 5 (4): 427-434
- **V plus Z: EVIDENCE-BASED CONTINUITY CLINIC REDESIGN, BEFORE AND AFTER RESIDENCY PROGRAM X plus Y ADOPTION**  
Stevenson, M., Yecies, E., Somani, S.  
SPRINGER.2024: S553
- **Artificial Intelligence in Cardiovascular Disease Prevention: Is it Ready for Prime Time?** *Current atherosclerosis reports*  
Parsa, S., Somani, S., Dudum, R., Jain, S. S., Rodriguez, F.  
2024
- **Simple models vs. deep learning in detecting low ejection fraction from the electrocardiogram** *EUROPEAN HEART JOURNAL - DIGITAL HEALTH*  
Hughes, J., Somani, S., Elias, P., Tooley, J., Rogers, A. J., Poterucha, T., Haggerty, C. M., Salerno, M., Ouyang, D., Ashley, E., Zou, J., Perez, M.  
2024
- **ARTIFICIAL INTELLIGENCE-ENABLED ANALYSIS OF CORONARY ARTERY CALCIUM TOPICS ON SOCIAL MEDIA**  
Somani, S., Balla, S., Peng, A. W., Dudum, R., Rodriguez, F.  
ELSEVIER SCIENCE INC.2024: 4611

- **Contemporary attitudes and beliefs on coronary artery calcium from social media using artificial intelligence.** *NPJ digital medicine*  
Somani, S., Balla, S., Peng, A. W., Dudum, R., Jain, S., Nasir, K., Maron, D. J., Hernandez-Boussard, T., Rodriguez, F.  
2024; 7 (1): 83
- **Just in time: detecting cardiac arrest with smartwatch technology.** *The Lancet. Digital health*  
Somani, S., Rogers, A. J.  
2024; 6 (3): e148-e149
- **Just in time: detecting cardiac arrest with smartwatch technology** *LANCET DIGITAL HEALTH*  
Somani, S., Rogers, A.  
2024; 6 (3): e148-e149
- **Segmenting computed tomograms for cardiac ablation using machine learning leveraged by domain knowledge encoding.** *Frontiers in cardiovascular medicine*  
Feng, R., Deb, B., Ganesan, P., Tjong, F. V., Rogers, A. J., Ruipérez-Campillo, S., Somani, S., Clopton, P., Baykaner, T., Rodrigo, M., Zou, J., Haddad, F., Zahari, et al  
2023; 10: 1189293
- **Advances in cardiac pacing with leadless pacemakers and conduction system pacing.** *Current opinion in cardiology*  
Somani, S., Rogers, A. J.  
2023
- **Artificial Intelligence-Enabled Analysis of Statin-Related Topics and Sentiments on Social Media.** *JAMA network open*  
Somani, S., van Buchem, M. M., Sarraju, A., Hernandez-Boussard, T., Rodriguez, F.  
2023; 6 (4): e239747
- **TOPICS AND SENTIMENTS AROUND STATINS ON REDDIT USING ARTIFICIAL INTELLIGENCE**  
Somani, S., Van Buchem, M., Sarraju, A., Hernandez-Boussard, T., Rodriguez, F.  
ELSEVIER SCIENCE INC.2023: 1637
- **Development and validation of a rapid visual technique for left ventricular hypertrophy detection from the electrocardiogram.** *Frontiers in cardiovascular medicine*  
Somani, S., Hughes, J. W., Ashley, E. A., Witteles, R. M., Perez, M. V.  
2023; 10: 1251511
- **Enhancing convolutional neural network predictions of electrocardiograms with left ventricular dysfunction using a novel sub-waveform representation.** *Cardiovascular digital health journal*  
Honarvar, H., Agarwal, C., Somani, S., Vaid, A., Lampert, J., Wanyan, T., Reddy, V. Y., Nadkarni, G. N., Miotto, R., Zitnik, M., Wang, F., Glicksberg, B. S.  
2022; 3 (5): 220-231
- **Population scale latent space cohort matching for the improved use and exploration of observational trial data.** *Mathematical biosciences and engineering : MBE*  
Gologorsky, R., Somani, S. S., Neifert, S. N., Valliani, A. A., Link, K. E., Chen, V. J., Costa, A. B., Oermann, E. K.  
2022; 19 (7): 6795-6813
- **Development of a machine learning model using electrocardiogram signals to improve acute pulmonary embolism screening.** *European heart journal. Digital health*  
Somani, S. S., Honarvar, H., Narula, S., Landi, I., Lee, S., Khachatoorian, Y., Rehmani, A., Kim, A., De Freitas, J. K., Teng, S., Jaladanki, S., Kumar, A., Russak, et al  
2022; 3 (1): 56-66
- **Population scale latent space cohort matching for the improved use and exploration of observational trial data** *MATHEMATICAL BIOSCIENCES AND ENGINEERING*  
Gologorsky, R., Somani, S. S., Neifert, S. N., Valliani, A. A., Link, K. E., Chen, V. J., Costa, A. B., Oermann, E. K.  
2022; 19 (7): 6795-6813
- **Using Deep-Learning Algorithms to Simultaneously Identify Right and Left Ventricular Dysfunction From the Electrocardiogram.** *JACC. Cardiovascular imaging*  
Vaid, A., Johnson, K. W., Badgeley, M. A., Somani, S. S., Bicak, M., Landi, I., Russak, A., Zhao, S., Levin, M. A., Freeman, R. S., Charney, A. W., Kukar, A., Kim, et al

2021

- **Health Equity in Artificial Intelligence and Primary Care Research: Protocol for a Scoping Review.** *JMIR research protocols*  
Wang, J. X., Somani, S., Chen, J. H., Murray, S., Sarkar, U.  
2021; 10 (9): e27799
- **Predictive Approaches for Acute Dialysis Requirement and Death in COVID-19.** *Clinical journal of the American Society of Nephrology : CJASN*  
Vaid, A., Chan, L., Chaudhary, K., Jaladanki, S. K., Paranjpe, I., Russak, A., Kia, A., Timsina, P., Levin, M. A., He, J. C., Bottinger, E. P., Charney, A. W., Fayad, et al  
2021; 16 (8): 1158-1168
- **Development and validation of techniques for phenotyping ST-elevation myocardial infarction encounters from electronic health records.** *JAMIA open*  
Somani, S., Yoffie, S., Teng, S., Havaladar, S., Nadkarni, G. N., Zhao, S., Glicksberg, B. S.  
2021; 4 (3): ooab068
- **Relational Learning Improves Prediction of Mortality in COVID-19 in the Intensive Care Unit.** *IEEE transactions on big data*  
Wanyan, T., Vaid, A., De Freitas, J. K., Somani, S., Miotto, R., Nadkarni, G. N., Azad, A., Ding, Y., Glicksberg, B. S.  
2021; 7 (1): 38-44
- **Contrastive Learning Improves Critical Event Prediction in COVID-19 Patients.** *Patterns (New York, N.Y.)*  
Wanyan, T., Honarvar, H., Jaladanki, S. K., Zang, C., Naik, N., Somani, S., De Freitas, J. K., Paranjpe, I., Vaid, A., Zhang, J., Miotto, R., Wang, Z., Nadkarni, et al  
2021: 100389
- **AKI in Hospitalized Patients with COVID-19.** *Journal of the American Society of Nephrology : JASN*  
Chan, L., Chaudhary, K., Saha, A., Chauhan, K., Vaid, A., Zhao, S., Paranjpe, I., Somani, S., Richter, F., Miotto, R., Lala, A., Kia, A., Timsina, et al  
2021; 32 (1): 151-160
- **Outcomes of Patients on Maintenance Dialysis Hospitalized with COVID-19.** *Clinical journal of the American Society of Nephrology : CJASN*  
Chan, L., Jaladanki, S. K., Somani, S., Paranjpe, I., Kumar, A., Zhao, S., Kaufman, L., Leisman, S., Sharma, S., He, J. C., Murphy, B., Fayad, Z. A., Levin, et al  
2021; 16 (3): 452-455
- **Blood Donation and COVID-19: Reconsidering the 3-Month Deferral Policy for Gay, Bisexual, Transgender, and Other Men Who Have Sex With Men.** *American journal of public health*  
Park, C., Gellman, C., O'Brien, M., Eidelberg, A., Subudhi, I., Gorodetsky, E. F., Asriel, B., Furlow, A., Mullen, M., Nadkarni, G., Somani, S., Sigel, K., Reich, et al  
2021; 111 (2): 247-252
- **Deep learning and the electrocardiogram: review of the current state-of-the-art.** *Europace : European pacing, arrhythmias, and cardiac electrophysiology : journal of the working groups on cardiac pacing, arrhythmias, and cardiac cellular electrophysiology of the European Society of Cardiology*  
Somani, S., Russak, A. J., Richter, F., Zhao, S., Vaid, A., Chaudhry, F., De Freitas, J. K., Naik, N., Miotto, R., Nadkarni, G. N., Narula, J., Argulian, E., Glicksberg, et al  
2021
- **Federated Learning of Electronic Health Records to Improve Mortality Prediction in Hospitalized Patients With COVID-19: Machine Learning Approach.** *JMIR medical informatics*  
Vaid, A., Jaladanki, S. K., Xu, J., Teng, S., Kumar, A., Lee, S., Somani, S., Paranjpe, I., De Freitas, J. K., Wanyan, T., Johnson, K. W., Bicak, M., Klang, et al  
2021; 9 (1): e24207
- **Retrospective cohort study of clinical characteristics of 2199 hospitalised patients with COVID-19 in New York City.** *BMJ open*  
Paranjpe, I., Russak, A. J., De Freitas, J. K., Lala, A., Miotto, R., Vaid, A., Johnson, K. W., Danieleto, M., Golden, E., Meyer, D., Singh, M., Somani, S., Kapoor, et al  
2020; 10 (11): e040736
- **Machine Learning to Predict Mortality and Critical Events in a Cohort of Patients With COVID-19 in New York City: Model Development and Validation.** *Journal of medical Internet research*  
Vaid, A., Somani, S., Russak, A. J., De Freitas, J. K., Chaudhry, F. F., Paranjpe, I., Johnson, K. W., Lee, S. J., Miotto, R., Richter, F., Zhao, S., Beckmann, N. D., Naik, et al

2020; 22 (11): e24018

- **Federated Learning of Electronic Health Records Improves Mortality Prediction in Patients Hospitalized with COVID-19.** *medRxiv : the preprint server for health sciences*  
Vaid, A., Jaladanki, S. K., Xu, J., Teng, S., Kumar, A., Lee, S., Somani, S., Paranjpe, I., De Freitas, J. K., Wanyan, T., Johnson, K. W., Bicak, M., Klang, et al  
2020
- **Characterization of Patients Who Return to Hospital Following Discharge from Hospitalization for COVID-19.** *Journal of general internal medicine*  
Somani, S. S., Richter, F., Fuster, V., De Freitas, J. K., Naik, N., Sigel, K., Bottinger, E. P., Levin, M. A., Fayad, Z., Just, A. C., Charney, A. W., Zhao, S., Glicksberg, et al  
2020; 35 (10): 2838-2844
- **Coronavirus 2019 and People Living With Human Immunodeficiency Virus: Outcomes for Hospitalized Patients in New York City.** *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America*  
Sigel, K., Swartz, T., Golden, E., Paranjpe, I., Somani, S., Richter, F., De Freitas, J. K., Miotto, R., Zhao, S., Polak, P., Mutetwa, T., Factor, S., Mehandru, et al  
2020; 71 (11): 2933-2938
- **Prevalence and Impact of Myocardial Injury in Patients Hospitalized With COVID-19 Infection.** *Journal of the American College of Cardiology*  
Lala, A., Johnson, K. W., Januzzi, J. L., Russak, A. J., Paranjpe, I., Richter, F., Zhao, S., Somani, S., Van Vleck, T., Vaid, A., Chaudhry, F., De Freitas, J. K., Fayad, et al  
2020; 76 (5): 533-546
- **Machine Learning in Cardiology-Ensuring Clinical Impact Lives Up to the Hype.** *Journal of cardiovascular pharmacology and therapeutics*  
Russak, A. J., Chaudhry, F., De Freitas, J. K., Baron, G., Chaudhry, F. F., Bienstock, S., Paranjpe, I., Vaid, A., Ali, M., Zhao, S., Somani, S., Richter, F., Bawa, et al  
2020; 25 (5): 379-390
- **Preoperative Nutritional Status as a Risk Factor for Major Postoperative Complications Following Anterior Lumbar Interbody Fusion.** *Global spine journal*  
Ukogu, C. O., Jacobs, S., Ranson, W. A., Somani, S., Vargas, L., Lee, N. J., Di Capua, J., Kim, J. S., Vig, K. S., Cho, S. K.  
2018; 8 (7): 662-667
- **Impact of Age on 30-day Complications After Adult Deformity Surgery.** *Spine*  
Phan, K., Kim, J. S., Somani, S., Di Capua, J., Kim, R., Shin, J., Cho, S. K.  
2018; 43 (2): 120-126
- **Diabetes Mellitus as a Risk Factor for Acute Postoperative Complications Following Elective Adult Spinal Deformity Surgery.** *Global spine journal*  
Di Capua, J., Lugo-Fagundo, N., Somani, S., Kim, J. S., Phan, K., Lee, N. J., Kothari, P., Vig, K. S., Cho, S. K.  
2018; 8 (6): 615-621
- **Predictors for Non-Home Patient Discharge Following Elective Adult Spinal Deformity Surgery.** *Global spine journal*  
Di Capua, J., Somani, S., Lugo-Fagundo, N., Kim, J. S., Phan, K., Lee, N. J., Kothari, P., Shin, J., Cho, S. K.  
2018; 8 (3): 266-272
- **Impact of Preoperative Anemia on Outcomes in Adults Undergoing Elective Posterior Cervical Fusion.** *Global spine journal*  
Phan, K., Dunn, A. E., Kim, J. S., Capua, J. D., Somani, S., Kothari, P., Lee, N. J., Xu, J., Dowdell, J. E., Cho, S. K.  
2017; 7 (8): 787-793
- **Hospital-Acquired Conditions in Adult Spinal Deformity Surgery: Predictors for Hospital-Acquired Conditions and Other 30-Day Postoperative Outcomes.** *Spine*  
Di Capua, J., Somani, S., Kim, J. S., Leven, D. M., Lee, N. J., Kothari, P., Cho, S. K.  
2017; 42 (8): 595-602
- **Comparing National Inpatient Sample and National Surgical Quality Improvement Program: An Independent Risk Factor Analysis for Risk Stratification in Anterior Cervical Discectomy and Fusion.** *Spine*  
Somani, S., Di Capua, J., Kim, J. S., Kothari, P., Lee, N. J., Leven, D. M., Cho, S. K.  
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- **High-Risk Subgroup Membership Is a Predictor of 30-Day Morbidity Following Anterior Lumbar Fusion.** *Global spine journal*  
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- **Anesthesia Duration as an Independent Risk Factor for Early Postoperative Complications in Adults Undergoing Elective ACDF.** *Global spine journal*  
Phan, K., Kim, J. S., Kim, J. H., Somani, S., Di'Capua, J., Dowdell, J. E., Cho, S. K.  
2017; 7 (8): 727-734
- **ASA Classification as a Risk Stratification Tool in Adult Spinal Deformity Surgery: A Study of 5805 Patients.** *Global spine journal*  
Somani, S., Capua, J. D., Kim, J. S., Phan, K., Lee, N. J., Kothari, P., Kim, J. H., Dowdell, J., Cho, S. K.  
2017; 7 (8): 719-726
- **Outcomes of Short Fusion versus Long Fusion for Adult Degenerative Scoliosis: A Systematic Review and Meta-analysis.** *Orthopaedic surgery*  
Phan, K., Xu, J., Maharaj, M. M., Li, J., Kim, J. S., Di Capua, J., Somani, S., Tan, K. A., Mobbs, R. J., Cho, S. K.  
2017; 9 (4): 342-349
- **Early Complications and Outcomes in Adult Spinal Deformity Surgery: An NSQIP Study Based on 5803 Patients.** *Global spine journal*  
Lee, N. J., Kothari, P., Kim, J. S., Shin, J. I., Phan, K., Di Capua, J., Somani, S., Leven, D. M., Guzman, J. Z., Cho, S. K.  
2017; 7 (5): 432-440
- **Elderly Age as a Risk Factor for 30-Day Postoperative Outcomes Following Elective Anterior Cervical Discectomy and Fusion.** *Global spine journal*  
Di Capua, J., Somani, S., Kim, J. S., Phan, K., Lee, N. J., Kothari, P., Cho, S. K.  
2017; 7 (5): 425-431
- **Intramedullary Nail Fixation of Atypical Femur Fractures With Bone Marrow Aspirate Concentrate Leads to Faster Union: A Case-Control Study.** *Journal of orthopaedic trauma*  
Lovy, A. J., Kim, J. S., Di Capua, J., Somani, S., Shim, S., Keswani, A., Hasija, R., Wu, Y., Joseph, D., Ghillani, R.  
2017; 31 (7): 358-362
- **Bone morphogenetic protein use in spine surgery in the United States: how have we responded to the warnings?** *The spine journal : official journal of the North American Spine Society*  
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2017; 17 (9): 1247-1254
- **Thirty-Day Morbidity Associated with Pelvic Fixation in Adult Patients Undergoing Fusion for Spinal Deformity: A Propensity-Matched Analysis.** *Global spine journal*  
Kothari, P., Somani, S., Lee, N. J., Guzman, J. Z., Leven, D. M., Skovrlj, B., Steinberger, J., Kim, J., Cho, S. K.  
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- **Predictors for Patient Discharge Destination After Elective Anterior Cervical Discectomy and Fusion.** *Spine*  
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2017; 42 (20): 1538-1544
- **Analysis of Risk Factors for Major Complications Following Elective Posterior Lumbar Fusion.** *Spine*  
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- **Frailty is associated with morbidity in adults undergoing elective anterior lumbar interbody fusion (ALIF) surgery.** *The spine journal : official journal of the North American Spine Society*  
Phan, K., Kim, J. S., Lee, N. J., Somani, S., Di Capua, J., Kothari, P., Leven, D., Cho, S. K.  
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- **Drug response consistency in CCLE and CGP.** *Nature*  
Bouhaddou, M., DiStefano, M. S., Riesel, E. A., Carrasco, E., Holzapfel, H. Y., Jones, D. C., Smith, G. R., Stern, A. D., Somani, S. S., Thompson, T. V., Birtwistle, M. R.  
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