HIEU (HUGH) **NGUYEN**

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EDUCATION

Ph.D. Candidate, Biomedical Engineering (Data Science Track) | Johns Hopkins University, MD, USA
2017-2023 (EXPECTED)
Dissertation Committee: Bharath Ambale-Venkatesh, Ph.D.; Eliseo Guallar, M.D., M.P.H.; Joao Lima, M.D; Jeff Siewerdsen, Ph.D.

Dissertation Topic:

Novel Machine Learning Methods for Time-to-event Analysis with Integration of Longitudinal Data and Image Data for Large Medical Databases

Relevant Coursework:

Medical Imaging Analysis, Precision Medicine, Machine Learning, Deep Learning, Causal Inference, Methods in Biostatistics, Epidemiologic Methods, Survival Analysis, Anatomy, Cardiac Electrophysiology, Computational Fluid Dynamics

B.S. in Mechanical Engineering | Trinity College, CT, USA
2013 – 2017
Cumulative GPA: 3.86/4.00, Major GPA: 3.96/4.00; Full Scholarship

PROFESSIONAL & RESEARCH EXPERIENCE

Data Scientist Co-op | Health Technologies, Apple Inc.
6/2021 – 12/2021 (EXPECTED)
Supervisor: Jason Wang (Ph.D.), Matt Bianchi (Ph.D.)

Focus on sleep pattern ("phenotype") discovery using real-world sleep tracking data collected from the Apple Watch, leveraging methods in statistical inference, unsupervised clustering, and time-series analysis

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Biomedical Data Scientist Intern | Perthera Inc.
5/2020 – 4/2021
Supervisor: Edik Blais (Ph.D.)

Built and prototyped the company's first-ever outcome prediction for treatment response in patients with pancreatic cancer, utilizing state-of-the-art advances in Survival Machine Learning and Statistical Methods on the largest real-world evidence (RWE) data in pancreatic cancer; drafted the patent claims of this product in support of the patent filing process

Developed the next generation of smart literature recommendation system that recommends the most relevant papers and abstracts to oncologists from a pool of 48,000+ Pubmed oncology papers and ASCO abstracts using NLP methods

Automated the process of extracting histological images from clinical reports to assemble big datasets for effectively training deep neural networks

Health Informatics Researcher | Johns Hopkins Hospital, Dept. of Critical Care

9/2018 – 2020

Supervisors: Robert Stevens (M.D.), Christian Storm (M.D.), Jose Suarez (M.D.), Joseph Greenstein (Ph.D.), Raimond Winslow (Ph.D.)

Developed and validated individualized real-time early warning models for various conditions/complications encountered in critical care such as cardiac arrest, hypoxemia, organ injury, and thrombosis, in partnership with physicians and engineers, using electronic health records of 200,000+ patients

Co-managed and consulted 8 research teams on every step of their data science projects: from data wrangling, handling missing data, feature selection, statistical analysis, model development, model interpretation, to oral and written presentation;

Three (3) projects won a total of 5 awards for best research and presentations at national conferences

Graduate Research Assistant | Johns Hopkins School of Engineering & School of Medicine

Cardiovascular Imaging Lab, Dept. of Cardiology & Radiology

6/2018 – PRESENT

Supervisors: Bharath Ambale-Venkatesh (Ph.D.), Joao Lima (M.D.)

Develop machine learning methods that are more accurate, more explainable, and better at handling multi-modal, high-dimensional, longitudinal medical data

Cardiovascular Artificial Intelligence Initiatives, Dept. of Cardiology

10/2019 – PRESENT

Supervisors: Cedric Manlhiot (Ph.D.)

Apply statistical and machine learning techniques to build and validate better risk prediction models for pediatric cardiac outcomes, using many different types of data such as Fitbit time-series exercise data, fever profiles, and electronic medical records

PhD Rotation - Laboratory of Unconventional Electrophysiology, Dept. of Cardiology

1/2018 – 6/2018

Supervisors: Hiroshi Ashikaga (M.D., Ph.D.)

Extracted features from patient CT scans and electrical mapping data, then used them to predict the likelihood of atrial fibrillation recurrence

PhD Rotation - Cardiac Bioelectric Systems Laboratory, Dept. of Biomedical Engineering

1/2018 – 6/2018

Supervisors: Leslie Tung (Ph.D.)

Developed and optimized a stretching system and culture condition that allow high-throughput, anisotropic, cyclic stretching of cardiac cells derived from stem cells or neonatal rat hearts

Contract Engineer | Medtronic Inc, Division of Minimally Invasive Surgeries
9/2016 – 5/2017
Supervisors: Jennifer McCabe, Timothy Windgarner (Ph.D.)

Designed, analyzed, and prototyped a testing fixture for Medtronic's Signia Surgical Stapler used in laparoscopic surgery; reducing cost per fixture by $245,000 i.e. saving the company the cost by *50 times* per instrument; improved fixture's portability and ease in use

Undergraduate Research Assistant | Cardiovascular Dynamics and Modeling, Trinity College, Dept. of Engineering
9/2014 – 5/2017
Supervisors: Joseph Palladino (Ph.D.)

Predicted performance of four FDA-approved left ventricular assist devices (LVADs) using mathematical models of the human circulatory system

Research Intern | Children's Hospital Colorado, University of Colorado School of Medicine, Dept. of Pediatrics & Cardiology
5/2014 – 8/2015
Supervisors: Shelley Miyamoto (M.D.), Kathryn Chatfield (M.D./Ph.D.), Brian Stauffer (M.D.)

Discovered 14 potential biomarkers for dilated cardiomyopathy in children using gene expression profiles of mRNAs and microRNAs related to cardiac fibrosis

Investigated expression of transcription factors related to cardiac development in children with hypertrophic cardiomyopathy.

HONORS AND AWARDS

Star Research Achievement Award | Society of Critical Care Medicine 2021 Virtual Conference
2021

The award recognizes excellence in critical care research

Star Research Achievement Award | Society of Critical Care Medicine 2020 Florida Conference
2020

The award recognizes excellence in critical care research

ACCM Research Day Award | Department of Anesthesiology and Critical Care Medicine at Johns Hopkins
2019 & 2020

Best poster presentation

Young Investigator Award | American Heart Association Resuscitation Science Symposium (RESS)
2019

The award is presented for top-scoring abstracts submitted to the symposium; AHA RESS is one of the most important meetings in the world for Cardiac Arrest

President's Fellow | Trinity College, Dept. of Engineering
2017

One senior student is selected as the best student from each major to represent their program of study

Presentation Award | Annual Biomedical Research Conference, American Society for Microbiology
2016

The award recognizes the best presentations at the conference

Junior Engineering Prize | Trinity College, Dept. of Engineering
2016

The award recognizes one rising senior engineering major who, voted by the Engineering faculty, has demonstrated outstanding academic achievement and shown evidence of professional development

Full Scholarship | Trinity College
2013-2017

All tuition, room, board, and required fees are covered

Research Grant | The Daniel and Janet Mordecai Foundation
2014

The grant provides stipends for a summer research and travel expenses to present research

One of Ten Young Promising Faces | Vietnamese Fund for Young Talents and National Committee Youth of Vietnam
2014

The award honors 10 Vietnamese under 35 years-old who stood out in fields of study, scientific research, production, society, sport, arts, and national defense

PUBLICATIONS

1. **H. Nguyen***, H. B. Kim*, Q. Jin*, S. Tamby, T. G. Romer, E. Sung, R. Li, J. Greenstein, J. I. Suarez, C. Storm, R. Winslow, R. D. Stevens, A Physiology-Driven Computational Model for Post-Cardiac Arrest Outcome Prediction, (2020) (available at https://arxiv.org/abs/2002.03309). *Under Review for Intensive Care Medicine.*

2. Palepu, A.K., Murali, A., Ballard, J.L., Li, R., Ramesh, S., **Nguyen, H.**, Kim, H., Sarma, S., Suarez, J.I. and Stevens, R.D. A Computational Model to Predict Brain Trauma Outcome in the Intensive Care Unit. medRxiv. (2020) (available at https://www.medrxiv.org/content/10.1101/2020.11.23.20237214v1).

3. L. Ciuffo, **H. Nguyen**, M. D. Marques, K. N. Aronis, B. Sivasambu, H. D. de Vasconcelos, S. Tao, D. D. Spragg, J. E. Marine, R. D. Berger, J. A. C. Lima, H. Calkins, H. Ashikaga, Periatrial Fat Quality Predicts Atrial Fibrillation Ablation Outcome, *Circ. Cardiovasc. Imaging* **12**, e008764 (2019).

4. K. C. Woulfe, A. K. Siomos, **H. Nguyen**, M. SooHoo, C. Galambos, B. L. Stauffer, C. Sucharov, S. Miyamoto, Fibrosis and Fibrotic Gene Expression in Pediatric and Adult Patients With Idiopathic Dilated Cardiomyopathy, *J. Card. Fail.* **23**, 314–324 (2017).

5. S. J. Nakano, A. K. Siomos, A. M. Garcia, **H. Nguyen**, M. SooHoo, C. Galambos, K. Nunley, B. L. Stauffer, C. C. Sucharov, S. D. Miyamoto, Fibrosis-Related Gene Expression in Single Ventricle Heart Disease, *J. Pediatr.* (2017), doi:10.1016/j.jpeds.2017.08.055.

NATIONAL CONFERENCE PRESENTATIONS, TALKS, & POSTERS

2/2021. “A Machine Learning Model to Predict Brain Trauma Outcome in the Intensive Care Unit“ Palepu, A.K., Murali, A., Ballard, J.L., Li, R., Ramesh, S., Nguyen, H., Kim, H., Sarma, S., Suarez, J.I. and Stevens, R.D. Critical Care Congress. *(Oral).*

10/2020. “Effect of Arterial Catheter on Vasopressor Use in Patients With Shock: A Propensity Score Matching Analysis on a Multi-Center Retrospective Cohort.” Nguyen H, Barros A, Lee H, Mclean S, Rivera P, Margare S, Alqaisi S, Samani S. Chest Annual Meeting.

2/2020. “A Physiology-Driven Computational Model for Post-Cardiac Arrest Outcome Prediction.” Nguyen H, Kim K, Jin Q, Tamby S, Romer T, Sung E, Liu R, Greenstein J, Winslow R , Suarez J, Storm C, Stevens R. Critical Care Congress. *(Oral).*

2/2020. “Effect of Arterial Catheters on Days on Vassopressors in the ICU: A Causal Inference Approach.” Nguyen H, Barros A, Samani S, Lee J, Rivera P, McLean S, Jagber M. Critical Care Congress Datathon. *(Oral).*

11/2019 - “A Machine Learning-Based Prediction of Cardiac Arrest Outcome Using a Large Multi-Center Database.” Nguyen H, Kim K, Jin Q, Tamby S, Romer T, Sung E, Liu R, Greenstein J, Winslow R , Suarez J, Storm C, Stevens R. AHA Resuscitation Symposium, AHA Annual Meeting.

9/2019 - “A Machine Learning-Based Prediction of Cardiac Arrest Outcome Using a Large Multi-Center Database.” Nguyen H, Kim K, Jin Q, Tamby S, Romer T, Sung E, Liu R, Greenstein J, Winslow R , Suarez J, Storm C, Stevens R. AHA Resuscitation Symposium, BMES Annual Meeting.

11/2016 - "Predicting Left Ventricular Assist Device (LVAD) Performance with Human Circulatory System Model.” Nguyen H, Palladino.” J. Sigma Xi Annual Meeting and Student Research Conference.

11/2016 - “Gene Expression of Transcription Factors in Pediatric Cardiomyopathy and Noonan Syndrome.” Nguyen H, Chatfield KC, Stauffer BL. Annual Biomedical Research Conference, American Microbiology Society.

1/2015 - “Fibrosis-Related Gene and MicroRNA Expression in Pediatric Idiopathic Dilated Cardiomyopathy.” Nguyen H, Siomos A, Nunley K, Stauffer BL, Sucharov CC, Miyamoto SD. American Federation for Medical Research, Western Regional Meeting. *(Oral).*

TEACHING EXPERIENCE:

Precision Care Medicine | Teaching Assistant, Johns Hopkins University School of Engineering, Dept. of Biomedical Engineering

FALL 2019 – PRESENT

Designed and led 3 lectures on high-performance computing, data wrangling, and statistical modeling methods; provided direct guidance to student’s teams in weekly meeting; create and grade quizzes; review students’ research proposals and manuscripts

Survival, Longitudinal, And Multivariate (SLAM) Working Group | Guest Lecturer, Johns Hopkins University School of Public Health, Dept. of Biostatistics

1/2020

Designed and led a 75-min talk reviewing state-of-the-art machine learning methods for survival analysis and their challenges

Engineering Mechanics | Teaching Assistant, Trinity College, Dept. of Engineering

FALL 2016

Held weekly review and homework help sessions; graded homework

Biomechanics | Teaching Assistant, BME-4-STEM, the Connecticut Health and Educational Facilities Authority (CHEFA)

SUMMER 2016

Taught middle-school teachers topics in Cardiovascular Dynamics so that they could apply to innovate middle school biomedical sciences curricula; Created simple, stand-alone interactive apps in human circulatory modeling to give to middle school teachers

Linear Algebra | Teaching Assistant, Trinity College, Dept. Mathematics

SPRING 2016

Assisted in creating more practical, real-world homework problems; Answer students' questions; Graded homework

SKILLS

Data Science| ML| Statistics	Skills: deep learning, survival analysis, statistical inference, causal inference, A/B testing, time-series analysis, model tuning, model stacking, data querying and manipulation, data visualization, feature selection, feature engineering, distributed computing, shell scripting, model deployment Software Tools: R, Python (TensorFlow, Keras, Pytorch) (5+ years of experience), SQL (BigQuery, PostgreSQL) (3+ years), MATLAB (8+ years), Unix Shell, Git (3+years), LaTeX, STATA, SAS
Cloud Platform	Google Colab, AWS, Microsoft Azure, Databricks
Container Tech	Docker
Engineering	COMSOL, SolidWorks, SPICE, Quartus, Arduino, Simulink, LabView
Coding Language	R, Python, Matlab, Java, C
Clinical Software	Vitrea Imaging, Slicer, MiPAV
Wetlab	PCR, Western Blot, Mass Spectrometry, Cell Culture, Stem Cell Harvest, Rat Surgery, Electrophoresis, Rat Surgery, Blue Native PAGE, RNA Extraction, cDNA Synthesis, Protein Assay, Human Tissue Collecting & Handling
Prototyping	Machine Shop, Wood Shop, Tensile Testing