

David S. Molony, B.Eng., Ph.D.

Data scientist with PhD in Biomedical Engineering and 10+ years of numerical and statistical modeling, data processing and machine learning. Front, back-end and deployment experience. Passionate about data, algorithms and self-learning.

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EDUCATION	Doctor of Philosophy (Ph.D.) in Biomedical Engineering <ul style="list-style-type: none">• University of Limerick, Ireland 2005-2010 Bachelor of Engineering (B.Eng.) in Mechanical Engineering <ul style="list-style-type: none">• University of Limerick, Ireland 2001-2005
EXPERIENCE	Research Scientist <i>Jul 2015 - Present</i> <i>Department of Medicine, Emory University, Atlanta, GA</i> <ul style="list-style-type: none">• Director of research at Emory Cardiovascular Imaging and Biomechanics Core laboratory. Lead inter-disciplinary team of engineers and clinicians.• Creator, developer and maintainer of DeepIVUS – A GUI-based deep learning platform for Intravascular Ultrasound (IVUS) image segmentation and classification. Data augmentation using GANs. Model achieved excellent agreement (CCC=0.96) with expert analysts.• Implemented algorithm for automatic ECG gating of IVUS images. Algorithm reduced manual interaction time by 90%. Research Engineer <i>Jan 2017-Present</i> <i>Covanos Inc., Atlanta, GA</i> <ul style="list-style-type: none">• Co-wrote successful Georgia Research Alliance grant (\$80,000) for fast computation of fractional flow reserve (FFR) from CCTA images.• Generated large annotated dataset of coronary lumen from CT images using traditional computer vision algorithms.• Trained graph convolutional neural network for lumen segmentation. Validation dataset accuracy of 85%. Post-doctoral Fellow <i>Jan 2011 – Jun 2015</i> <i>Biomedical Engineering, Georgia Institute of Technology, Atlanta, GA</i> <ul style="list-style-type: none">• Associated primary modes of deformation in 3D models of rabbit aorta with hemodynamics using statistical shape analysis (PCA).• Implemented dynamic programming algorithm for lumen segmentation.• Course instructor for Biotransport. Responsible for lecture content, lecturing and setting exam.
PROJECTS	<ul style="list-style-type: none">• Fine-tuned and deployed NLP language model (GPT-2) for autocompleting cardiovascular text. Deployed with GKE. (cardioassistai.com)• Developed large scale cardiology abstract recommender system with React frontend, MySQL + Flask backend. Fine-tuned BioBERT model for learning abstract embeddings. Locality sensitive hashing for fast approximate nearest neighbor search on embeddings.
SKILLS	<ul style="list-style-type: none">• <i>Languages (order of proficiency):</i> Python, Matlab, Javascript, R, C++• <i>Build & Deploy:</i> GCP (Cloud Run & GKE), AWS, Docker, Flask, React, SQL• <i>Libraries:</i> TensorFlow v1.0 & 2.0, PyTorch, scikit-learn, numpy, Pandas• <i>IDEs:</i> PyCharm, VS Code, Jupyter• <i>Other:</i> DICOM, 3D Slicer, PyQt5, Bash, Markdown, Git, vtk, SimpleITK

