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

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

| EXPERIENCE | |
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**Research Scientist**                                                      *Jul 2015 - Present*

*Department of Medicine, Emory University, Atlanta, GA*

- 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 for analysts by 50%.

**Research Engineer**                                                      *Jan 2017-Present*

*Covanos Inc., Atlanta, GA*

- Co-wrote successful Georgia Research Alliance grant ($80,000) for fast computation of fractional flow reserve (FFR) from CT images.
- Generated large annotated dataset of coronary vessels from CT images using traditional computer vision algorithms.
- Used graph convolutional networks (PinSage) for lumen segmentation. Obtained superior intersection over union to traditional algorithms.

**Post-doctoral Fellow**                                                   *Jan 2011 – Jun 2015*

*Biomedical Engineering, Georgia Institute of Technology, Atlanta, GA*

- Associated primary modes of deformation in 3D MRI models of rabbit aorta with hemodynamics using statistical shape analysis i.e. PCA.
- Implemented dynamic programming algorithm for lumen segmentation.
- Course instructor for Biotransport. Responsible for lecture content, lecturing and setting exam.

| PROJECTS | |
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- Fine-tuned and deployed NLP language model (GPT-2) for autocompleting cardiovascular text. Deployed with GKE using Docker. (cardioassistai.com)
- Developed large scale cardiology abstract recommender system with React frontend, mySQL + Flask backend. Trained hierarchical transformer for generating abstract embeddings. Locality sensitive hashing for fast approximate nearest neighbor search on embeddings.

| EDUCATION | |
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**Doctor of Philosophy (Ph.D.) in Biomedical Engineering**

- University of Limerick, Ireland 2005-2010

**Bachelor of Engineering (B.Eng.) in Mechanical Engineering**

- University of Limerick, Ireland 2001-2005

| SKILLS | |
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- *Languages (order of proficiency):* Python, Matlab, Scala, Javascript, R,
- *Build & Deploy*:  GCP (Cloud Run & GKE), AWS, Docker, Flask, React, SQL
- *Libraries*: TensorFlow, PyTorch, scikit-learn, numpy, pydicom, Spark,
- *IDEs*: PyCharm, VS Code, Jupyter, Eclipse, Databricks
- *Other*: DICOM, 3D Slicer, PyQt5, Bash, Markdown, Git, vtk, SimpleITK