Ryan Godwin, PhD

Assistant Professor and Senior Data Scientist, University of Alabama at Birmingham

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POSITIONS

FEB 2025 – PRESENT
Assistant Professor and Senior Data Scientist
University of Alabama at Birmingham
Department of Anesthesiology and Perioperative Medicine, with a secondary appointment in Radiology and the Imaging Informatics Division.

JUL 2021 – PRESENT
Founder
Blaze Pascal, LLC, Winston-Salem, NC

SEP 2022 – AUG 2023
Biomedical Innovation Fellow
University of Alabama at Birmingham

OCT 2021 – FEB 2025
Instructor and Data Scientist
University of Alabama at Birmingham

AUG 2019 – OCT 2021
Senior Research Associate
Atrium Health Wake Forest Baptist
Research Associate until November 2020.

JUL 2018 – JUL 2019
Partner
Breakthrough Technology, Winston-Salem, NC

AUG 2017 – MAY 2018
Visiting Assistant Professor of Physics
Wake Forest University

AUG 2014 – NOV 2019
Licensed Soccer Coach
NC Fusion, Winston-Salem, NC

APR 2013 – PRESENT
Cofounder
Apeiron Engineering (Lotz, Lacasse, Godwin, LLC), Flagstaff, AZ

AUG 2012 – MAY 2017
Graduate Research and Teaching Assistant
Wake Forest University

JAN 2009 – NOV 2012
Software Developer
Lowell Discovery Telescope (formerly Discovery Channel Telescope), Flagstaff, AZ

EDUCATION

GRADUATED MAY 2017
Ph.D. Physics
Wake Forest University
Certificate in Structural and Computational Biophysics. Dissertation: Binding NEMO: Adventures in Molecular Dynamics.

GRADUATED MAY 2008
M.S. Applied Physics
Northern Arizona University
Graduated with Distinction (4.0 GPA). Thesis: Fast Folding Proteins: Analysis Based on the Energy Landscape and Transition State Ensemble.

GRADUATED MAY 2005
B.S. Physics and Astronomy, Math Minor
University of Arizona, Tucson, AZ

AWARDS

2026 — **Excellence in Technology Award**
Society for Technology in Anesthesia Annual Meeting, Tampa, FL
Model Foundry: Generative AI for Rapid Design Diagrams with Clinical Applications.

2025 — **Blazer Bridge Fund Innovation Award**
University of Alabama at Birmingham
IRB Assistant: Generative AI for Accelerated, Compliant Human Subject Research Protocol Development.

2025 — **Honorable Mention, Poster Award**
Society for Technology in Anesthesia, Tempe, AZ
An AI-Generated Podcast Tool to Enhance Engagement with Anesthesiology Literature Among Trainees.

2024 — **Best Abstract**
UAB Anesthesiology Research Day
Continuous Assessment of Cerebral Autoregulation After Subarachnoid Hemorrhage in Neuro ICU: A Feasibility Study.

2023 — **Hounsfield Unit Award (Best CT Research Project)**
Society of Advanced Body Imaging Annual Meeting
A Fully Automated AI Algorithm for Opportunistic Screening of Cardiomegaly on Chest or Abdominal CT.

2022 — **Introduction to Academic Radiology for Scientists travel award**
Radiological Society of North America

2019 — **AI Competition: Brain CT**
American Society for Functional Neuroradiology Annual Meeting
Third place for hemorrhage detection and second place for normal versus abnormal for age.

2019 — **New Ventures Accelerator, first place**
F6S, Winston-Salem, NC

2017 — **Outstanding Physics Teaching Assistant**
Wake Forest University

2016–2017 — **Deacon Springboard Finalist**
Wake Forest University

2014–2016 — **NIH T32 Training Grant in Structural and Computational Biophysics**
Wake Forest University

2014 — **Elected to Sigma Pi Sigma**
Wake Forest University

2007 — **Elected to Golden Key Honor Society**
Northern Arizona University

PUBLICATIONS

2026 — **Godwin, R. C.**, Melvin, R. L.
UMLBot: Generative AI for Converting Natural Language and Code Excerpts to Editable UML Diagrams
SoftwareX, 35, 102789

2026 **Godwin, R. C.**, Soundararajan, K., Melvin, R. L.
Practical Follow-Up to Foundation Models Article
Physiology, 41(5), 421

2026 Freitag, H. E., Melvin, R. L., **Godwin, R. C.**, Ness, T. J.
Transitional Pain Services and Clinics: A Scoping Review of Recent Literature
Journal of Pain Research, 19, 1–15

2026 Coute, R. A., Toy, J., Soundararajan, K., von Schwenitz, B., Siler, P. J., **Godwin, R. C.**, Melvin, R. L.
National Institutes of Health Funding for Venous Thromboembolism Research
Journal of Thrombosis and Haemostasis (in press)

2025 Coute, R. A., Soundararajan, K., Kurz, M. C., Melvin, R. L., **Godwin, R. C.**
Use of Machine Learning Models to Identify National Institutes of Health-Funded Cardiac Arrest Research
Resuscitation, 208, 110545

2025 **Godwin, R. C.**, Tung, A., Berkowitz, D. E., Melvin, R. L.
Transforming Physiology and Healthcare through Foundation Models
Physiology, 40(3)

2025 Mladinov, D., **Godwin, R. C.**, Benz, D., Folorunso, I. M., Berkowitz, D. E., Melvin, R. L.
The Impact of Blood Pressure Below Personalized Lower Cerebral Autoregulation Limit on Outcomes After Cardiac Surgery: A Retrospective Study
Journal of Cardiothoracic and Vascular Anesthesia, 39(3), 601–609

2024 Soundararajan, K., Nathanson, B. H., Adams, D. J., Mader, T. J., **Godwin, R. C.**, Melvin, R. L., Coute, R. A.
Use of Machine Learning Models to Predict Neurologically Intact Survival for Advanced Age Adults Following Out-of-Hospital Cardiac Arrest
Academic Emergency Medicine

2024 Barker, A. B.*, Melvin, R. L.*, **Godwin, R. C.**, Benz, D., Wagener, B. M.
Machine Learning Predicts Unplanned Care Escalations for Post-Anesthesia Care Unit Patients during the Perioperative Period: A Single-Center Retrospective Study
Journal of Medical Systems, 48(1), 69

2024 **Godwin, R. C.**, DeBerry, J. J., Wagener, B. M., Berkowitz, D. E., Melvin, R. L.
Grant Drafting Support with Guided Generative AI Software
SoftwareX, 27

2024 **Godwin, R. C.**, Melvin, R. L., Berkowitz, D. E., Gosling, A. F.
Measurement of Pulse Arrival Time and Arterial Stiffness in Patients Undergoing Cardiac Surgery
Journal of Cardiothoracic and Vascular Anesthesia, 38(10), 2493–2495

2024 Jiang, B., Ozkara, B. B., Zhu, G., ... **Godwin, R. C.**, ... Zaharchuk, G., Wintermark, M.
Assessing the Performance of Artificial Intelligence Models in Neuroradiology: Insights from the American Society of Functional Neuroradiology AI Competition
American Journal of Neuroradiology

2024 Gowd, A. K., Beck, E. C., Agarwalla, A., Patel, D. M., **Godwin, R. C.**, Waterman, B. R., Little, M. T., Liu, J. N.
Machine Learning Algorithms Exceed Comorbidity Indices in Prediction of Short-Term Complications After Hip Fracture Surgery
Journal of the American Academy of Orthopaedic Surgeons

2024 **Godwin, R. C.***, Melvin, R. L.*
Toward Efficient Data Science: A Comprehensive MLOps Template for Collaborative Code Development and Automation
SoftwareX, 26, 101723

2024 **Godwin, R. C.**, Flood, W. C., Hudson, J. P., Benayoun, M. D., Zapadka, M. E., Melvin, R. L., Whitlow, C. T.
Automated Extraction of Heart Rate Variability from Magnetoencephalography Signals
Heliyon, 10, e26664

2024 **Godwin, R. C.***, Paiste, H. J.*, Smith, A. D., Berkowitz, D. E., Melvin, R. L.
Strengths-Weaknesses-Opportunities-Threats Analysis of Artificial Intelligence in Anesthesiology and Perioperative Medicine
Frontiers in Digital Health, 6, 1316931

2024 **Godwin, R. C.**, Bryant, A. S., Wagener, B. M., Ness, T. J., DeBerry, J. J., Horn, L. L., Graves, S. H., Archer, A. C., Melvin, R. L.
IRB-draft-generator: A Generative AI Tool to Streamline the Creation of Institutional Review Board Applications
SoftwareX, 25, 101601

2023 Perchik, J., **Godwin, R. C.**, West, J., Summerlin, D., Smith, A.
Does ChatGPT Pass the LIRADS Test? Comparing Quality of AI Generated Impressions to Human Reports
Japanese Journal of Gastroenterology and Hepatology

2023 **Godwin, R. C.**, Melvin, R. L.
The Role of Quality Metrics in the Evolution of AI in Healthcare and Implications for Generative AI
Physiological Reviews

2023 **Godwin, R. C.**, Tridandapani, S.
Beyond the AJR: Applying Screening Algorithms (Artificially) Intelligently
American Journal of Roentgenology

2023 Sotoudeh, H., Rezaei, A., **Godwin, R. C.**, Prattipati, V., Singhal, A., Sotoudeh, M., Tanwar, M.
Prediction of Spontaneous Basal Ganglia Hematoma Expansion: A Pilot Study
Cureus, 15(4)

2021 Treacher, A. H., Garg, P., Davenport, E., **Godwin, R. C.**, Proskovec, A., Bezerra, L. G., Murugesan, G., Wagner, B., Whitlow, C. T., Stitzel, J. D., Maldjian, J. A., Montillo, A. A.
MEGnet: Automatic ICA-Based Artifact Removal for MEG using Spatiotemporal Convolutional Neural Networks
NeuroImage, 241

2018 **Godwin, R. C.**, Macnamara, L. M., Alexander, R. W., Salsbury Jr., F. R.
Structure and Dynamics of tRNAMet Containing Core Substitutions
ACS Omega, 3(9), 10668–10678

2018 Melvin, R. L., Xiao, J., Berenhaut, K. S., **Godwin, R. C.**, Salsbury Jr., F. R.
Using Correlated Motions to Determine Sufficient Sampling Times for Molecular Dynamics
Physical Review E, 98(2), 023307

2018 Melvin, R. L., Xiao, J., **Godwin, R. C.**, Berenhaut, K. S., Salsbury Jr., F. R.
Visualizing Correlated Motion with HDBSCAN Clustering
Protein Science, 27(1), 62–75

2018 **Godwin, R. C.**, Gmeiner, W. H., Salsbury Jr., F. R.
All-Atom Molecular Dynamics Comparison of Disease-Associated Zinc Fingers
Journal of Biomolecular Structure and Dynamics, 36(10), 2581–2594

2017 Melvin, R. L., Thompson, W. G., **Godwin, R. C.**, Gmeiner, W. H., Salsbury Jr., F. R.
MutS□ 's Multi-Domain Allosteric Response to Three DNA Damage Types Revealed by Machine Learning
Frontiers in Physics, 5(10)

2017

Godwin, R. C.
Binding NEMO: Adventures in Molecular Dynamics
Doctoral dissertation, Wake Forest University

2017

Godwin, R. C., Melvin, R. L., Gmeiner, W. H., Salsbury Jr., F. R.
Binding Site Configurations Probe Structure and Dynamics of the Zinc-Finger NEMO (NF-□ B Essential Modulator)
Biochemistry, 56(4), 623–633

2016

Melvin, R. L., **Godwin, R. C.**, Xiao, J., Thompson, W. G., Berenhaut, K. S., Salsbury Jr., F. R.
Uncovering Large-Scale Conformational Change in Molecular Dynamics without Prior Knowledge
Journal of Chemical Theory and Computation, 12(12), 6130–6146

2016

Godwin, R. C., Gmeiner, W. H., Salsbury Jr., F. R.
Importance of Long-Time Simulations for Rare Event Sampling in Zinc Finger Proteins
Journal of Biomolecular Structure and Dynamics, 34(1), 125–134

2015

Godwin, R. C.*, Melvin, R. L.*, Salsbury Jr., F. R.
Molecular Dynamics Simulations and Computer-Aided Drug Discovery
In W. Zhang (Ed.), Computer-Aided Drug Discovery, 1–30. Springer

2012

Lotz, P. J., Lacasse, M. J., **Godwin, R. C.**
Discovery Channel Telescope Software Component Template and State Design: Principles and Implementation
Proc. SPIE 8451, Software and Cyberinfrastructure for Astronomy II, 845108

2010

Lotz, P. J., Greenspan, D., **Godwin, R. C.**, Taylor, P.
Discovery Channel Telescope Software Development Overview
Proc. SPIE 7740, Software and Cyberinfrastructure for Astronomy, 77401M

2008

Godwin, R. C., Young, R. D.
Fast Folding Proteins: Analysis Based on the Energy Landscape and Transition State Ensemble
Master's thesis, Northern Arizona University

** Equal contribution.*

MEDIA

JULY 2026

New Generative AI Tool Improves Design Diagrams for Clinical Systems
Anesthesiology News, interview by Michael Vlessides
Coverage of UMLBot, the award-winning STA 2026 abstract on turning plain language and code into editable design diagrams.

OPEN-SOURCE PROJECTS

2026

UMLBot
Turns natural language and code into editable UML diagrams with generative AI.
github.com/UABGH-Emerging-Technologies/UMLBot

2026

Credit Scorecard Builder
Builds bespoke clinical risk models with a credit-scoring approach.
github.com/UABGH-Emerging-Technologies/CreditScorecardBuilder

2025

Label Maker
A text annotation tool.
github.com/UABGH-Emerging-Technologies/label_maker_publication

2025

LLM Utils
Common code for building generative AI tools.
github.com/UABGH-Emerging-Technologies/llm_utils

2024 **IRB Assistant**
An open source tool that uses generative AI to create a first draft of an IRB protocol form.
github.com/UABGH-Emerging-Technologies/IRB_Assistant_Publication

2024 **Grant Guide**
A drafting tool that uses guided generative AI to support grant writing.
github.com/UABGH-Emerging-Technologies/Grant_Guide_Publication

2023 **MLOps Template**
A template framework for traceable machine learning and AI.
github.com/UABGH-Emerging-Technologies/Templates

2023 **HRV from MEG**
Automated extraction of heart rate variability from magnetoencephalography.
doi.org/10.1016/j.heliyon.2024.e26664

2018 **Sufficient Sampling Correlation**
Code and examples for choosing molecular dynamics sampling times from correlated motion.
doi.org/10.6084/m9.figshare.6613481.v1

2017 **Correlation Clustering with HDBSCAN**
Code for visualizing correlated motion in molecular dynamics.
doi.org/10.6084/m9.figshare.5140234.v2

2015 **Markov Cluster Analysis in Matlab**
A Matlab implementation of Markov cluster analysis.
doi.org/10.6084/m9.figshare.1566809