

DR. BRETT A. MEYERS

3631 Litchfield Lane
West Lafayette, IN 47906
(609) 234-7122 (cell)
brett.albert.meyers@gmail.com
<https://www.linkedin.com/in/brett-a-meyers/>

RESEARCH ASSISTANT PROFESSOR
Eli Lilly & Company and Purdue University
Alliance Research Center (LPRC)
1201 Mitch Daniels Blvd
West Lafayette, IN 47907
meyers18@purdue.edu

RESEARCH INTEREST

Cardiac biomechanics (hemodynamics, tissue dynamics), Experimental fluid/tissue mechanics, Measurement science & uncertainty quantification, Clinical determinants from medical imaging, Micro-scale flows in medical devices.

EDUCATION

- PhD** **Purdue University** | Mechanical Engineering | Graduation: April 2021
Dissertation: Methods for echocardiographic biomechanical measurements
- MSME** **Virginia Tech** | Mechanical Engineering | Graduation: July 2014
Thesis: Feasibility of Echo-PIV for evaluation of cardiac LV filling function
- BSME** **Drexel University** | Mechanical Engineering | Graduation: June 2011
Thesis: Biofactory-on-a-Chip

JOURNAL PUBLICATIONS

1. Derakshandeh, R., Bhattacharya, S., **Meyers, B. A.**, & Vlachos, P. P. Uncertainty Quantification for Ultrasound Speckle Image Velocimetry. (*Accepted by the Journal of the Royal Society Interface*)
2. Wang, L., Gao, Z., **Meyers, B. A.**, Vlachos, P. P., Tchong, J. E., & Denardo, S. J. Improving Machine Learning Outcomes Prediction of Social Determinants of Health Effect on Percutaneous Coronary Intervention Using Random Oversampling. (*Accepted by BMC Medical Research Methodology*)
3. Brinken, M., **Meyers, B.A.**, Payne, R.M., Axt-Fliedner, R., Yerebakan, C., Vlachos, P. and Loke, Y.H., 2025. Longitudinal Intracardiac Right Ventricular Flow Analysis in Infants With Hypoplastic Left Heart Syndrome in Interstage I Using Novel Doppler Velocity Reconstruction. *Journal of the American Heart Association*, p.e041734. [[doi](#)]
4. **Meyers, B.A.** and Vlachos, P.P., 2025. Video-based pupillometry using Fourier Mellin image correlation. *Scientific Reports*, 15(1), p.26153. [[doi](#)]
5. Derakhshandeh, R., **Meyers, B.A.**, Zhang, J., Veilleux, J.C., Shi, G.H. and Vlachos, P.P., 2025. Subcutaneous depot formation and diffusion in autoinjector delivery: insights from high-speed synchrotron imaging. *International Journal of Pharmaceutics*, p.125804. [[doi](#)]
6. **Meyers, B.A.** and Vlachos, P.P., 2025. Flow measurements in clinical cardiac imaging. *Physical Review Fluids*, 10(2), p.020501. [[doi](#)]
7. **Meyers, B. A.**, Bhattacharya, S., Brindise, M. C., Loke, Y. H., Payne, M. R., & Vlachos, P. P., 2024. Fetal and neonatal echocardiographic analysis of biomechanical alterations for the systemic right ventricle heart. *PLOS One*, 19(9), p.e0308645. [[doi](#)]
8. Chakraborty, S., Bhattacharya, S., **Meyers, B.A.**, Sepúlveda, M.S. and Vlachos, P.P., 2024. Evolution of Cardiac Tissue and Flow Mechanics in Developing Japanese Medaka. *PLOS One*, 19(8), p.e0309018. [[doi](#)]
9. Sharmin, R., Brindise, M. C., Kolliyil, J. J., **Meyers, B. A.**, Zhang, J., & Vlachos, P. P., 2024. ovel interpretable Feature set extraction and classification for accurate atrial fibrillation detection from ECGs. *Computers in Biology and Medicine*, 179, p.108872. [[doi](#)]

10. Denardo, S.J., Vlachos, P.P., **Meyers, B.A.**, Babakhani-Galangashi, R., Wang, L., Gao, Z. and Tchong, J.E., 2024. Translating proof-of-concept for platelet slip into improved antithrombotic therapeutic regimens. *Platelets*, 35(1), p.2353582. [\[doi\]](#)
11. Cater, D.T., **Meyers, B.A.**, Mitra, S., Bhattacharya, S., Machado, R.F., Serrano, R., Rowan, C.M., Gaston, B. and Vlachos, P., 2023. Novel Echocardiogram Analysis of Cardiac Dysfunction is Associated with Mortality in Pediatric Sepsis. *Shock*, pp.10-1097. [\[doi\]](#)
12. **Meyers, B.A.**, Zhang, J., Nyce, J., Loke, Y.H. and Vlachos, P.P., 2024. Enhanced echocardiographic assessment of intracardiac flow in congenital heart disease. *PLOS One*, 19(3), p.e0300709. [\[doi\]](#)
13. **Meyers, B.***, Nyce, J.*, Zhang, J., Frank, L. H., Balaras, E., Vlachos, P. P., & Loke, Y. H., 2023. Intracardiac Flow Analysis of the Right Ventricle in Pediatric Patients with Repaired Tetralogy of Fallot Using a Novel Color Doppler Velocity Reconstruction. *Journal of the American Society of Echocardiography*, 36(6), pp.644-653. [\[doi\]](#)
14. Ishizaka, S., Iwano, H., Tsujinaga, S., Murayama, M., Tsuneta, S., Aoyagi, H., Tamaki, Y., Motoi, K., Chiba, Y., Tanemura, A., Nakabachi, M., Yokoyama, S., Nishino, H., Okada, K., **Meyers, B. A.**, Vlachos, P. P., Sato, T., Kamiya, K., Watanabe, M., Kaga, S., Nagai, T., Oyama-Manabe, N., & Anzai, T., 2023. Determinants of exercise capacity in patients with heart failure without left ventricular hypertrophy. *Journal of Cardiology*, 81(1), pp.33-41. [\[doi\]](#)
15. **Meyers, B. A.**, Brindise, M. C., Kutty, S., & Vlachos, P. P., 2022. A method for direct estimation of left ventricular global longitudinal strain rate from echocardiograms. *Scientific reports*, 12(1), 1-11. [\[doi\]](#)
16. Chiba, Y., Iwano, H., Tsuneta, S., Tsujinaga, S., **Meyers, B.**, Vlachos, P., Ishizaka, S., Motoi, K., Aoyagi, H., Tamaki, Y., Tanemura, A., Murayama, M., Yokoyama, S., Nakabachi, M., Nishino, H., Kaga, S., Kamiya, K., Ohira, H., Tsujino, I., & Anzai, T., 2022. Determinants of altered left ventricular suction in pre-capillary pulmonary hypertension. *European Heart Journal-Cardiovascular Imaging*, 23(10), pp.1399-1406. [\[doi\]](#)
17. Brindise, M. C., **Meyers, B. A.**, Kutty, S., & Vlachos, P. P., 2021. Automated Peak Prominence-Based Iterative Dijkstra's Algorithm for Segmentation of B-Mode Echocardiograms. *IEEE Transactions on Biomedical Engineering*, 69(5), pp.1595-1607. [\[doi\]](#)
18. Chakraborty, S., **Meyers, B. A.**, Iwano, H., Hall, M. E., & Vlachos, P. P., 2021. A wavelet approach to the estimation of left ventricular early filling wave propagation velocity from color m-mode echocardiograms. *Ultrasound in Medicine & Biology*, 47(5), pp.1397-1407. [\[doi\]](#)
19. Erickson, C. T., **Meyers, B.**, Li, L., Craft, M., Jani, V., Bliamptis, J., Moukagna, K. S. B., Danford, D. A., Vlachos, P., & Kutty, S., 2021. Progression of left ventricular diastolic function in the neonate and early childhood from transmitral color M-mode filling analysis. *Pediatric research*, 89(4), pp.987-995. [\[doi\]](#)
20. **Meyers, B. A.**, Goergen, C. J., Segers, P., & Vlachos, P. P., 2020. Colour-Doppler echocardiography flow field velocity reconstruction using a streamfunction–vorticity formulation. *Journal of the Royal Society Interface*, 17(173), pp.20200741. [\[doi\]](#)
21. Brindise, M. C.*, **Meyers, B. A.***, & Vlachos, P. P., 2020. Universality of vortex ring decay in the left ventricle. *Journal of Biomechanics*, 103, pp.109695. [\[doi\]](#)
22. Acuna, A.*, Berman, A. G.*, Damen, F. W.*, **Meyers, B. A.***, Adelsperger, A. R.*, Bayer, K. C., Brindise, M. C., Bungart, B., Kiel, A. M., Morrison, R. A., Muskat, J. C., Wasilczuk, K. M., Wen, Y., Zhang, J., Zito, P., & Goergen, C. J., 2018. Computational fluid dynamics of vascular disease in animal models. *Journal of Biomechanical engineering*, 140(8), pp. 080801. [\[doi\]](#)
23. Londono-Hoyos, F. J., Swillens, A., Van Cauwenberge, J., **Meyers, B.**, Koppula, M. R., Vlachos, P., Chirino, J. A., & Segers, P., 2018. Assessment of methodologies to calculate intraventricular

pressure differences in computational models and patients. *Medical & biological engineering & computing*, 56(3), pp.469-481. [doi]

24. **Meyers, B. A.**, Goergen, C. J., & Vlachos, P. P., 2018. Development and validation of a phase-filtered moving ensemble correlation for echocardiographic particle image velocimetry. *Ultrasound in Medicine & Biology*, 44(2), pp.477-488. [doi]
25. Iwano, H., Pu, M., Upadhyya, B., **Meyers, B.**, Vlachos, P., & Little, W. C., 2014. Delay of left ventricular longitudinal expansion with diastolic dysfunction: impact on load dependence of e' and longitudinal strain rate. *Physiological reports*, 2(7), pp.e12082. [doi]

* Indicates shared co-authorship between primary authors

MANUSCRIPTS IN PROGRESS, UNDER REVIEW, AND PRE-PRINTS

1. **Meyers, B. A.***, Dimitroglou, Y.*, Vlachos, P. P., & Aggeli, C. Combining Cardiac Function and Liver Disease Severity for Enhanced Medium-Term Outcome Predictions in Liver Cirrhosis. (*Under review with PLOS One*)
2. Babakhani Galangashi, R., **Meyers, B. A.**, Goergen, C. J., Segers, P., & Vlachos, P. P. Vascular Doppler Velocity Reconstruction Using a Streamfunction-Vorticity Approach. (*Under review with Scientific Reports*)
3. Denardo, S., Wang, L., **Meyers, B. A.**, Vlachos, P. P., & Tchong, J. E. Stent Design Selection, Outcomes and Disparities for Urgent Coronary Interventional Patients in a Challenged Rural South Environment. (*Under review with the North Carolina Medical Journal*)
4. Hardikar, P., **Meyers, B. A.**, Sable, C., Vlachos, P., & Loke, Y.H. Intracardiac Flow Analysis of the Right and Left Ventricle of Patients with Repaired Tetralogy of Fallot Before and After Pulmonary Valve Replacement Using a Novel Color Doppler Velocity Reconstruction. (*Under review with the Annals of Biomedical Engineering*)
5. Mitra, S., **Meyers, B. A.**, & Vlachos, P. P. Evolution of Left Ventricular Filling Vortex in the Growing Heart. (*Under review with Journal of the American Society of Echocardiography*)
6. Sharmin, R., **Meyers, B. A.**, Dimitroglou, Y., & Vlachos, P. A Fusion Framework based on Artificial Intelligence and Machine-vision (FAIM) to Left Ventricle (LV) Segmentation from B-mode Echocardiograms. (*Under review with IEEE Access*)
7. Zhang, J., **Meyers, B. A.**, Brindise, M. C., Loke, Y. H., & Vlachos, P. P. Evaluation of Left Ventricular Diastolic Filling Wave Propagation Velocity. (*Under review with Journal of Biomechanical Engineering*)
8. Aravindaksham, M.R., **Meyers, B. A.**, Dimitroglou, Y., Mandal, C., Pothen, A., & Vlachos, P. A Whole-Body Cardiovascular Digital Twin Using a Zero-Dimensional Lumped Parameter Model. (*In preparation*)
9. Castro, J.R., Kalompatsou, I., **Meyers, B. A.**, Dimitroglou, Y., Aggeli, C., & Vlachos, P. Intraoperative left ventricle flow analysis in transcatheter edge-to-edge mitral valve repair. (*In preparation*)
10. Cater, D.T., **Meyers, B. A.**, Machado, R.F., Serrano, R., Rowan, C.M., Gaston, B. and Vlachos, P., 2023. Quantifying Ventricular Flow Dynamics in Pediatric Sepsis using Echocardiographic Doppler Velocity Reconstruction. (*In preparation*)
11. Loke, Y.H., O'Hara, R., Muegge, W., Drews, K., Axt-Flidner, R., Klein, J., Friesen, R., Dove, M., Hieu, T., Kochav, J., Christopher, A., Olivieri, L., Krishnamurthy, R., Wang, L., Balaras, E., Hershenson, J., Amedro, P., **Meyers, B. A.**, Vlachos, P., & Capuano, F. Right Ventricular-to-Aortic Energetic Mismatch as a 4D Flow Marker: Insights from the Tetralogy of Fallot 4D flow Registry of Energetics and Kinetics (TREC). (*In preparation*)

12. **Meyers, B. A.**, Steinhubl, S., & Vlachos, P. P. Echocardiographic identification of fluid overload associated with left ventricular dysfunction using machine learning. (*In preparation*)
13. Mitra, S., **Meyers, B. A.**, Kethireddy, S., Dugar, S., & Vlachos, P. Kinetic Energy and Energy Loss as Novel Echocardiographic Parameters in Sepsis Progression. (*In preparation*)
14. Naum, A.S., Saravanan, S., Agamy, M., **Meyers, B. A.**, **Meyers, B. A.**, Payne, R.M., Vlachos, P.P., & Loke, Y.H. Complementary intracardiac diastolic flow analysis of single ventricle patients using Doppler Echocardiography and 4D flow Cardiac Magnetic Resonance. (*In preparation*)

* Indicates shared co-authorship between primary authors

CONFERENCE PROCEEDINGS

1. Derakhshandeh, R., Bhattacharya, S., **Meyers, B.**, & Vlachos, P. (2021, July). Ultrasound PIV Uncertainty Quantification. *ISPIV21; 14th International Symposium on Particle Image Velocimetry, Chicago, IL, August 1-4, 2021*. Illinois Institute of Technology. [\[doi\]](#)
2. **Meyers, B.**, Charonko, J., Pu, M., Little, W., & Vlachos, P. (2013, July). Robust clinical cardiac Echo Particle Image Velocimetry (EchoPIV). *ISPIV13; 10th International Symposium on Particle Image Velocimetry, Delft, The Netherlands, July 1-3, 2013*. Delft University of Technology, Faculty of Mechanical, Maritime and Materials Engineering, and Faculty of Aerospace Engineering. [\[doi\]](#)

CONFERENCE PRESENTATIONS & POSTERS

1. Naum, A., Loke, Y.H., **Meyers, B.**, Payne, R. and Vlachos, P. (2025, November). Advanced Complementary Imaging Analysis of Single Ventricle Patients Using Cardiac Magnetic Resonance and Echocardiography. *American Heart Association's 2025 Scientific Sessions*, New Orleans, LA.
2. Phan, T., Barbosa, J.A., Brown, K., Roshanitabrizi, P., Rwebembera, J., Vlachos, P., **Meyers, B.**, Okello, E., Beaton, A., Linguraru, M. and Nunes, M.C. (2025, November). Strain and Deep Learning-Derived Mitral Regurgitation Features Are Independently Associated With Rheumatic Heart Disease-an analysis from the GOAL Trial. *American Heart Association's 2025 Scientific Sessions*, New Orleans, LA.
3. Mitra, S., **Meyers, B.**, & Vlachos, P. (2025, March). Left Ventricular Kinetic Energy and Energy Loss as Novel Echocardiographic Biomarkers in Sepsis Prognostication. *American College of Cardiology's 2025 Scientific Sessions*, Chicago, IL.
4. Yang, C., Hardikar, P., **Meyers, B.**, & Loke, YH. (2025, March). Correlation of Intracardiac Flow Parameters in Patients with Repaired Tetralogy of Fallot Using Doppler Velocity Reconstruction with Functional Capacity Measured by Exercise Intolerance. *American College of Cardiology's 2025 Scientific Sessions*, Chicago, IL.
5. Singh, A., Hans, A., **Meyers, B.A.**, Bilonis, I, & Vlachos, P.P. (2025, January). Dynamic analysis of cardiac flow using 4D flow MRI. *2025 Global CMR Conference*, Washington DC.
6. Singh, A., Hans, A., Yang, H., **Meyers, B.A.**, Rayz, V.L., Bilonis, I, & Vlachos, P.P. (2025, January). Automated segmentation reconstruction and analysis of cerebral vasculature flow using 4D Flow MRI. *2025 Global CMR Conference*, Washington DC.
7. Cater, D., **Meyers, B.**, Rowan, C., Gaston, B., & Vlachos, P. (2025, January). 1586: Novel Echocardiogram Hydrodynamic Indices are Associated with Outcome in Pediatric Sepsis. *2025 Critical Care Conference*, Orlando, FL.
8. **Meyers, B.**, Loke, YH., Payne, R.M., & Vlachos, P. (2024, November). Intracardiac Flow Analysis of Single Ventricle Hearts. *American Physical Society, Division of Fluid Dynamics 77th Annual Meeting*, Salt Lake City, UT.
9. Anand, P., Singh, A., Yang H., **Meyers, B.A.**, Socha, J., & Vlachos, P.P. (2024, November). Snake tongue flicking: A fluid mechanics approach. *American Physical Society, Division of Fluid Dynamics 77th Annual Meeting*, Salt Lake City, UT.

10. Singh, A., Anand, P., Yang H., **Meyers, B.A.**, & Vlachos, P.P. (2024, November). A Physics-Informed and Uncertainty-Informed Radial Basis Function Meshless Proper Orthogonal Decomposition for 3D Particle Racking Velocimetry (PTV). *American Physical Society, Division of Fluid Dynamics 77th Annual Meeting*, Salt Lake City, UT.
11. **Meyers, B.**, Dimitroglou, Y., Aggeli, C., & Vlachos, P. (2024, November). Echocardiographic Biomarkers Enhance Mortality Predictions in Cirrhosis Patients. *American Heart Association's 2024 Scientific Sessions*, Chicago, IL.
12. Hardikar, P., **Meyers, B.**, Sable, C. A., Vlachos, P., & Loke, Y. H. (2024, April). Early and Late Features of Intracardiac Flow in Repaired Tetralogy of Fallot (rTOF) Patients Using Doppler Velocity Reconstruction (DoVeR). *American College of Cardiology 2024 Scientific Sessions*, Atlanta, GA.
13. Babakhani Galangashi, R., Bhattacharya, S., **Meyers, B. A.**, & Vlachos, P. (2023, November). Application of stereomicroscope in volumetric micro-PIV. *American Physical Society, Division of Fluid Dynamics 76th Annual Meeting*, Washington, D.C.
14. Bhattacharya, S., **Meyers, B.**, Loke, YH., Payne, M., & Vlachos, P. (2023, November). Investigating Blood Flow Patterns and Hydrodynamics of the Perinatal Single Ventricle Heart: An In Vivo Study. *American Physical Society, Division of Fluid Dynamics 76th Annual Meeting*, Washington, D.C.
15. Singh, A., Anand, P., Eshraghi, J., **Meyers, B. A.**, Bhattacharya, S., & Vlachos, P. P. (2023, November). Wakes of Three Cylinders in a Falling Soap Film: Linking Lagrangian Coherent Structures from PIV to Interferograms. *American Physical Society, Division of Fluid Dynamics 76th Annual Meeting*, Washington, D.C.
16. **Meyers, B.**, Zhang, J., Loke, YH., & Vlachos, P. (2023, November). Assessment of right ventricle intracardiac flow in congenital heart disease: Comparison of enhanced echocardiography and 4D flow MRI measurements. *American Physical Society, Division of Fluid Dynamics 76th Annual Meeting*, Washington, D.C.
17. Hardikar, P., **Meyers, B.**, Sable, C. A., Vlachos, P., & Loke, Y. H. (2023, November). Early and Late Features of Intracardiac Flow in Repaired Tetralogy of Fallot (rTOF) Patients Using Doppler Velocity Reconstruction (DoVeR). *American Heart Association's 2023 Scientific Sessions*, Chicago, IL.
18. Cater, D., Mitra, S., Bhattacharya, S., **Meyers, B.**, Serrano, R., Rowan, C., & Vlachos, P. (2023, January). 1237: Novel Analysis of Echocardiogram Indices and Their Association with Outcomes in Pediatric Sepsis. *2023 Critical Care Conference*, San Francisco, CA.
19. Mitra, S., **Meyers, B. A.**, Bhattacharya, S., & Vlachos, P. P. (2022, November). Characterization of left ventricle vortex ring decay in the growing heart. *American Physical Society, Division of Fluid Dynamics 75th Annual Meeting*, Indianapolis, IN.
20. Zhang, J., **Meyers, B.**, Brindise, M., Loke, Y. H., & Vlachos, P. (2022, November). Evaluation of Left Ventricular Flow Propagation Velocity from Multi-Dimensional Cardiac Imaging. *American Physical Society, Division of Fluid Dynamics 75th Annual Meeting*, Indianapolis, IN.
21. Babakhani Galangashi, R., **Meyers, B. A.**, Bhattacharya, S., Eshraghi, J., & Vlachos, P. (2022, November). Vascular velocity reconstruction using Color Doppler flow field velocity. *American Physical Society, Division of Fluid Dynamics 75th Annual Meeting*, Indianapolis, IN.
22. Derakhshandeh, R., Bhattacharya, S., **Meyers, B.**, & Vlachos, P. (2022, November). Ultrasound Image Velocimetry (UIV) Uncertainty Quantification. *American Physical Society, Division of Fluid Dynamics 75th Annual Meeting*, Indianapolis, IN.
23. Sharmin, R., Zhang, J., **Meyers, B.**, Bhattacharya, S., Eshraghi, J., & Vlachos, P. (2022, November). Color Doppler Echocardiography Velocity Reconstruction using Data Fusion with 4D Flow MRI. *American Physical Society, Division of Fluid Dynamics 75th Annual Meeting*, Indianapolis, IN.

24. **Meyers, B.**, Nyce, J., Zhang, J., Loke, Y. H., & Vlachos, P. (2022, October). Validation of Echocardiography Color Doppler Velocity Reconstruction against 4D Flow MRI in Assessment of Right Ventricular Intracardiac Flow. *American Heart Association's 2022 Scientific Sessions*, Chicago, IL.
25. **Meyers, B. A.**, Bhattacharya, S., Brindise, M., Loke, Y. H., Payne, R. M., & Vlachos, P. (2022, October). Quantification of Flow and Biomechanics by Echocardiography (echo) in the Fetal Single Ventricle (SV). *American Heart Association's 2022 Scientific Sessions*, Chicago, IL.
26. Zhang, J., **Meyers, B.**, Brindise, M., Loke, Y. H., & Vlachos, P. (2022, November). Evaluation of Left Ventricular Flow Propagation Velocity from Multi-Dimensional Cardiac Imaging. *American Heart Association's 2022 Scientific Sessions*, Chicago, IL.
27. Nyce, J., **Meyers, B.**, Zhang, J., Frank, L., Balaras, E., Vlachos, P., & Loke, Y. H. (2022, April). Assessment of abnormal right ventricular vorticity in repaired Tetralogy of Fallot patient using Doppler velocity reconstruction (DoVer). *American College of Cardiology Conference 2022*, Washington, D.C.
28. **Meyers, B.**, Brindise, M., Payne, M., & Vlachos, P. (2022, April). Flow and biomechanics quantification in the single ventricle [SV]. *American College of Cardiology Conference 2022*, Washington, D.C.
29. **Meyers, B.**, Paul, G., & Vlachos, P. (2022, April). Detecting abnormal left ventricular function using gradient boosting learning. *American College of Cardiology Conference 2022*, Washington, D.C.
30. Chiba, Y., Iwano, H., Tsuneta, S., Tsujinaga, S., **Meyers, B.**, Vlachos, P., Ishizaka, S., Motoi, K., Aoyagi, H., Tamaki, Y., Tanemura, A., Murayama, M., Yokoyama, S., Nakabachi, M., Nishino, H., Kaga, S., Kamiya, K., Ohira, H., Tsujino, I., & Anzai, T. (2022, April). Determinants of impaired left ventricular suction in pre-capillary pulmonary hypertension. *American College of Cardiology Conference 2022*, Washington, D.C.
31. **Meyers, B.**, Brindise, M., Sharmin, R., Zhang, J., & Vlachos, P. (2022, April). Detecting atrial fibrillation in ECGs using correlation-based features and machine learning. *American College of Cardiology Conference 2022*, Washington, D.C.
32. Derakhshandeh, R., Bhattacharya, S., **Meyers, B.**, & Vlachos, P. (2021, August). Ultrasound PIV uncertainty quantification. *The 14th International Symposium on Particle Image Velocimetry*, Chicago, IL.
33. **Meyers, B. A.**, Brindise, M., Payne, R. M., & Vlachos, P. (2019). Fetal and Pediatric Heart Flow and Function in Hypoplastic Left Hearts. *The International conference on Biomechanics and Medical Engineering*, San Diego, CA.
34. **Meyers, B. A.**, Brindise, M., Kutty, S., & Vlachos, P. (2019, September). Fully-Automated B-mode Analysis for Left Ventricle Measurements. *The International conference on Biomechanics and Medical Engineering*, San Diego, CA.
35. **Meyers, B.**, Payne, R. M., & Vlachos, P. (2018, November). Tiny hearts in big trouble: cardiac flow hydrodynamics in fetal single ventricle hearts. *American Physical Society, Division of Fluid Dynamics 71st Annual Meeting*, Atlanta, GA.
36. Erickson, C. T., **Meyers, B.**, Li, L., Craft, M., Vlachos, P., Danford, D. A., & Kutty, S. (2018, November). Color m-mode echocardiography derived left ventricular diastolic indices in infants strongly correlate with left ventricular linear dimensions. *American Heart Association's 2018 Scientific Sessions*, Chicago, IL.
37. Erickson, C. T., Li, L., **Meyers, B.**, Craft, M., Schuster, A., Vlachos, P., & Kutty, S. (2017, November). Maturation of Early Diastolic Left Ventricular Function is Largely Complete in the First Month of Life: Insights from Semiautomated Analysis of Color M-Mode Echocardiographic Filling Velocities. *American Heart Association's 2017 Scientific Sessions and Resuscitation Science Symposium*, Chicago IL.

38. **Meyers, B.**, Goergen, C., Scalo, C., & Vlachos, P. (2017, June). Color Doppler Echocardiogram Velocimetry Flow Reconstruction Using Streamfunction-Vorticity Formulation, *3rd Annual Summer Biomechanics, Bioengineering and Biotransport Conference*, Tucson, AZ.
39. **Meyers, B.**, Vlachos, P., Goergen, C., & Scalo, C. (2016, November). Color Doppler Ultrasound Velocimetry Flow Reconstruction using Vorticity-Streamfunction Formulation. *American Physical Society, Division of Fluid Dynamics 69th Annual Meeting*, Portland, OR.
40. **Meyers, B.**, Vlachos, P., Charonko, J., Giarra, M., & Goergen, C. (2015, November). Accuracy and Robustness Improvements of Echocardiographic Particle Image Velocimetry for Routine Clinical Cardiac Evaluation. *American Physical Society, Division of Fluid Dynamics 68th Annual Meeting*, Boston, MA.
41. Londoño Hoyos, F. J., **Meyers, B.**, Vlachos, P., Chirinos, J., & Segers, P. (2014, November). Assessment of intraventricular pressure gradients in patients with heart failure with preserved ejection fraction during an acute dose of sublingual Nitro-Glycerin. *13th Belgian National Day on Biomedical Engineering*, Brussels, Belgium.
42. Londoño, F., **Meyers, B.**, Vlachos, P., Segers, P., & Chirinos, J. (2014, October) P6. 8 Effect of organic nitrates on intraventricular pressure gradients in heart failure patients with preserved ejection fraction. *Artery Research*, 8(4), 147-147.
43. Bhattacharya, S., **Meyers, B.**, Giarra, M., La Foy, R., & Vlachos, P. (2013, November). Uncertainty estimation for Stereo-Particle Image Velocimetry measurements. *American Physical Society, Division of Fluid Dynamics 66th Annual Meeting*, Pittsburg, PA.
44. Iwano, H., Pu, M., Upadhyaya, B., **Meyers, B.**, Vlachos, P., & Little, W. C. (2013, November). Relation of Early Diastolic Mitral Annular Velocity, Mitral Flow Velocity, and Left Ventricular Strain Rate on Intraventricular Pressure Difference. *American Heart Association's 2013 Scientific Sessions and Resuscitation Science Symposium*, Chicago, IL.
45. Iwano, H., Pu, M., Upadhyaya, B., **Meyers, B.**, Vlachos, P., & Little, W. C. (2013, November). The Determinants of Early Diastolic Intra Left Ventricular Pressure Difference. *American Heart Association's 2013 Scientific Sessions*, Chicago IL.
46. Ohara, T., Iwano, H., Pu, M., **Meyers, B.**, Charonko, J., Vlachos, P., & Little, W. C. (2013, November). "Left Ventricular Systolic Circumferential Deformation is Associated with Left Ventricular Diastolic Apical Suction", *Japanese Heart Failure 17th Annual Scientific Meeting*.
47. **Meyers, B.**, Charonko, J., Pu, M., Little, W. C., & Vlachos, P. (2013, July) Robust clinical cardiac Echo Particle Image Velocimetry (EchoPIV). *The 10th International Symposium on Particle Image Velocimetry*, Delft, Netherlands.

*More than a dozen undergraduate research abstracts accepted for poster or oral presentation at Purdue University's Office of Undergraduate Research and other external conferences.

PATENTS AND INTELLECTUAL PROPERTY

PATENTS

1. **Meyers, B. A.**, Vlachos, P. P., and Brindise, M. *System architecture and method of processing images*. U.S. 2021/0287375 A1, filed March 11, 2021, and issued November 11, 2023.
2. **Meyers, B. A.**, and Vlachos, P. P. *System architecture and method of processing images*. U.S. 2021/0287371 A1, filed March 11, 2021, and issued September 19, 2023.
3. Scalo, C., Vlachos, P. P. and **Meyers, B. A.** *Method of processing an image*. U.S. Patent 11,506, 783 B2, filed March 4, 2019, and issued November 22, 2022.
4. Vlachos, P. P., and **Meyers, B. A.** *Video processing methods and software architectures for analyzing transformation in objects*. U.S. 2020/0175686 A1, filed November 26, 2019, and issued September 7, 2021.

INTELLECTUAL PROPERTY DISCLOSURES

1. *Assessment of the Drug Delivery Phenomena in the Tissue Injection using High-speed Synchrotron Radiography* (2023)
2. *A Method for Automatic Echocardiogram Segmentation* (2020)
3. *A Method for Direct Estimation of Heart Mechanics from Echocardiograms* (2020)
4. *Method for optical detection of neurological alterations* (2019)
5. *Method for Reconstructing Two Component Velocity Fields from Ultrasound Color Doppler Scans* (2017)

MEDIA MENTIONS

1. Purdue engineer, IU cardiologist collaborate to offer innovative tool and fresh hope for babies with heart defects, *Purdue EVPRP Research Articles* (online; 2023)
2. Babies Born with Broken Hearts: A collaboration of medicine and engineering in Indiana explores cardiac flow hydrodynamics in fetal single ventricle hearts (*across several outlets*)
3. Out of the box: Diagnosing concussions with a smart phone, *Journal of Purdue Undergraduate Research* (2017)

ACADEMIC, TEACHING, AND PROFESSIONAL EXPERIENCE

ACADEMIC APPOINTMENTS

Purdue University, West Lafayette, IN

Research Assistant Professor, Discovery Park July 2024-Present

Assistant Director, Health Ambassadors with the Eli Lilly and Company and Purdue University Research Alliance Center (HEAL) Jan. 2024-Present

Research Scientist, Regenstrief Center for Healthcare Engineering (RCHE) Aug. 2023-July 2024

Postdoctoral Researcher, School of Mechanical Engineering May 2021-Aug. 2023

Advisor: Pavlos P. Vlachos

Research Associate, School of Mechanical Engineering July 2014-Apr. 2021

Advisor: Pavlos P. Vlachos

Virginia Tech, Blacksburg, VA

Research Associate, Mechanical Engineering Department Aug. 2011-July 2014

Advisor: Pavlos P. Vlachos

Drexel University, Philadelphia, PA

Research Assistant, Department of Mechanical Engineering and June 2008-June 2011

Mechanics

Advisor: MinJun Kim

TEACHING EXPERIENCE

Purdue University, West Lafayette, IN

Instructor Aug. 2023-Present

Fluid Mechanics Lab, ME30801 (1 semester; Fall 2025)

Fluid Mechanics, ME308 (1 semester; Fall 2023)

Research in Mechanical Engineering, ME 498/499 (3 semesters)

Vertically Integrated Projects, VIP 179/279 (4 semesters)

Mentor, Capstone Projects Aug. 2021-Present

Engineering Design, ME 463 (1 semester; Spr. 2025)

Data Science Capstone, CS 490 (1 semester; Spr. 2024)

Engineering Technology Capstone, ENGT 480/481 (2 semesters)

Teaching Assistant Fluid Mechanics, ME309 (4 semesters) Virginia Tech , Blacksburg, VA	Aug. 2014-Aug. 2016
Teaching Assistant Junior Lab, ME4005 (1 semester) Senior Lab, ME4006 (1 semester)	Aug. 2011-Dec. 2011 Jan. 2012-May 2012
PROFESSIONAL EXPERIENCE	
Johnson & Johnson , Consumer Group, Lititz, PA Position: Process Engineer	Apr. 2010-Sept. 2010
Agilent Technologies , Wilmington, DE Position: Research & Design Engineer	Sept. 2008-Mar. 2009
Kensey Nash Corp. , Exton, PA Position: Biomaterials Engineer	Sept. 2007-Mar. 2008
MENTORSHIP EXPERIENCE	
GRADUATES	
Deerajkumar Parthipan† Project: Assessment of Atrioventricular Valve Regurgitation before and after surgical repair.	Spring 2022-Fall 2025
Abeeb Lambo† Project: Automated methodology for longitudinal strain estimation of the left heart using a simplified primary axis approach to estimate deformation.	Spring 2024- Fall 2025
Ruhi Sharmin† Project: Signal Processing and Machine Learning for Cardiac Diagnostics: ECG, Echocardiography, And MRI Applications	Fall 2021- Fall 2025
Adele Lesioti† Project: Yet to be determined.	Fall 2025-Present
Andrew Hanchen Liu† Project: Assessment of intraventricular hydrodynamics changes in early neonatal life.	Fall 2024-Present
Shailee Mitra* Project: Characterization of Left Ventricle Vortex Ring Decay in the Growing Heart.	Fall 2021-Present
* Serving as a PhD thesis committee member † Serving as Co-advisor	
UNDERGRADUATES	
Aishwarya Kunigal, Colvin Timmons, Nicholas Doherty, Rahul Appoji Project: Fluid mechanics evaluation of Norwood shunt designs and anastomosis.	Fall 2025 - Present
Rahul Appaji Project: To be determined.	Fall 2025 - Present
Elliott Shi Project: Clinical Predictors of Interstage Risk in Infants with Single Ventricle Physiology	Summer 2025-Present

Liam Rochet	Summer 2025-Present
Project: Fabrication of Patient-Specific Compliant Aorta model for In Vitro Flow Experiments	
Abby Elisabeth Gansler, Zoe N Campagna, Sparsh Bansal	Spr. 2025-Present
Project: Identification of stress effects on subvisible particles during large molecule drug manufacturing and injection.	
Kara Rochelle McCrindle	Summer 2024-Present
Projects: In vitro MRI phantoms for MRI data harmonization; Fluid mechanics evaluation of Norwood shunt designs and anastomosis.	
Haseung Jun	Summer 2024-Present
Project: Automated quantification of atrioventricular valve regurgitation in congenital and acquired heart disease.	
Brianna Nicole Lewis	Summer 2024-Present
Project: Assessment of echocardiographic biomarkers from sepsis and septic shock patients.	
Clairice Audrene Holmes	Fall 2024-Spr. 2025
Project: Fluid mechanics of phonation.	
Jennifer Heather Quercioli	Fall 2024-Spr. 2025
Projects: Automated Evaluation of Single Ventricle Biomechanics in Pediatric Echocardiography; Fluid mechanics evaluation of Norwood shunt designs and anastomosis.	
John Cappetta	Fall 2020-Fall 2022
Projects: Design of a Butterfly IQ portable ultrasound holder; Automated unidimensional longitudinal strain (ULS) for detecting abnormal cardiac motion.	
Danielle Newhouse	Spr. 2018-Fall 2022
Project: Detecting abnormal pupil light reflex after alcohol ingestion in abusive partner relationships.	
VISITING SCHOLARS	
Stavros Papapanagiotou	Fall 2025-Present
Project: Design considerations for single-use intrathecal drug delivery devices.	
Ioannis Dimitroglou	Spr. 2025-Present
Project: Clinical research on medical imaging and heart failure and cardiac disease.	
Jorge Alberto Roa Castro	Fall 2024-Spr. 2025
Projects: Assessment of cerebral aneurysm rupture risk through quantifying local fluid mechanics parameters using 4D flow MRI.	
AWARDS AND HONORS	
AnalytiXIN Fellow	Aug. 2024 – Present
MSME, Mechanical Engineering (<i>with distinction</i>)	Virginia Tech
BSME, Mechanical Engineer (<i>Cum Laude</i>)	Drexel University
Dean's undergraduate honors list	Drexel University
Travel Award, Purdue University	\$1000 (cumulative)
Augusta H. Hess Mechanical Engineering Scholarship	\$2,000 (cumulative)
A. J. Drexel Merit Scholarship	\$16,000 (cumulative)

H & T Kraiker Endowment Scholarship	\$24,000 (cumulative)
Pi Tau Sigma Inductee	Nov. 2010
National Society of Collegiate Scholars Inductee	Sept. 2009
National Cooperative Education Honor Society Inductee	May 2008
Drexel ASME Mentorship Chair	Sept. 2010 - June 2011

MEMBERSHIPS/AFFILIATIONS

American Society of Mechanical Engineers (ASME)	Sept. 2007 – Present
American Physical Society (APS)	Nov. 2011 – Present
American Heart Association (AHA)	Sept. 2021 – Present
Biomedical Engineering Society (BMES)	Aug. 2024 – Present

SERVICE ACTIVITIES

PEER REVIEWER

1. American Heart Association Fellowship Peer Review Committee (Fall 2024 – Present)
Radiology/Imaging/Surgery

JOURNAL REVIEWER

(More than a dozen papers reviewed in the following journals):

1. ASME Journal of Biomechanical Engineering
2. BMC Cardiovascular Disorders
3. Nature Scientific Reports
4. Pediatric Cardiology
5. BMC Pediatrics

CONFERENCE ORGANIZATION

1. Session Chair – Biofluids: Respiratory Flows I, *American Physical Society, 76th Annual Meeting for the Division of Fluid Dynamics*, Washington, D.C.
2. Session organizer – multiple topic areas, *American Physical Society, 75th Annual Meeting for the Division of Fluid Dynamics*, Indianapolis, IN.

RESEARCH SUPPORT

ACTIVE

An Integrated and Automated Tool for Quantification of Biomechanics in Fetal and Neonatal Echocardiography

Sponsor: Eunice Kennedy Shriver National Institute of Child Health and Human Development

Proposal amount: \$431,893

Role: Key Personnel (Research Assistant Professor); Co-authored proposal submission

Bedside Ultrasound Pilot to Investigate the Development of Congestion in Heart Failure

Sponsor: Regenstrief Center for Healthcare Engineering, Purdue University

Proposal amount: \$100,000

Role: Co-Principal Investigator

Drug Development and Delivery of Biopharmaceuticals (Purdue internal)

Sponsor: John Martinson Honors College, Purdue University

Proposal amount: \$60,000

Role: Co-Principal Investigator

Eli Lilly-Genetic Medicine

Sponsor: Eli Lilly and Company

Proposal amount (2026): \$448,661.39

Role: Key Personnel (Research Assistant Professor)

SELECTED (AWARDED BUT NOT ACTIVE)

Next-Generation Biopharmaceuticals (Purdue internal)

Sponsor: John Martinson Honors College, Purdue University

Proposal amount: \$62,809

Role: Principal Investigator

SUBMITTED

Normative Pediatric Intracardiac Flow Ranges from Pediatric Heart Network Echocardiograms and Development of an AI-Assisted Doppler Reconstruction Tool (NIH NHLBI)

Sponsor: National Heart, Lung, and Blood Institute

Proposal amount: \$ 222,754

Role: Principal Investigator

Novel Intracardiac Flow Analysis for predictive imaging biomarkers of Atrioventricular Valve Regurgitation Severity in Fontan Failure

Sponsor: American Heart Association

Proposal amount: \$229,288

Role: Principal Investigator

COMPLETED

AnalytiXIN Consortium

Sponsor: Central Indiana Corporate Partnership

Proposal amount: \$50,000

Role: Co-Principal Investigator

IN DEVELOPMENT

Right Ventricular Dysfunction in Acute Volume Overload: Novel Assessment of Pressure-Volume Relationships using Catheterization and Echocardiography

Sponsor: National Institutes of Health

Proposal amount: \$435,157

Role: Co-Principal Investigator; Co-authored proposal submission

Novel Echo-Based Biomechanical Assessment of Single Ventricle Diastolic Dysfunction to Improve the Assessment of Fontan Failure (NIH NHLBI)

Sponsor: National Heart, Lung, and Blood Institute

Proposal amount: \$ 560,160.

Role: Principal Investigator

Novel Intracardiac Flow Analysis for predictive imaging biomarkers of Atrioventricular Valve Regurgitation Severity

Sponsor: Saving Tiny Hearts Foundation

Proposal amount: \$100,000

Role: Principal Investigator

Automated assessment of 4D flow MRI for atrioventricular valve regurgitation (AVVR) in single ventricle (SV) patients

Sponsor: Additional Ventures Foundation

Proposal amount: \$659,997

Role: Co-Principal Investigator

Multimodality analysis of hemodynamic forces in repaired Tetralogy of Fallot (rTOF) patients to inform the indications for transcatheter pulmonary valve replacement (NIH NHLBI)

Sponsor: National Heart, Lung, and Blood Institute

Proposal amount: \$619,314

Role: Key Personnel (Research Assistant Professor), Co-authored proposal submission

Developing Tools for Measuring Fluid Dynamics in Atrioventricular Regurgitation Using 3D-Printed Heart Valves (Purdue internal)

Sponsor: Ralph W. and Grace M. Showalter Research Trust

Proposal amount: \$70,000

Role: Principal Investigator