

## CURRICULUM VITAE

### Samuel W. Remedios

Ph.D. Student

The Johns Hopkins University

Clark 201B, 3400 North Charles Street

Baltimore, MD 21218, USA

Email: [samuel.remedios@jhu.edu](mailto:samuel.remedios@jhu.edu)

Web: <https://sremedios.github.io>

Phone: REDACTED

Citation Statistics: [Google Scholar](#)

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### 1 Research Interests

Automated image processing and computer vision with application to medical imaging, particularly through machine learning, statistics, information theory. Current projects touch on self-supervised training, super-resolution, density estimation, and distribution matching.

### 2 Education & Training

Ph.D.	2020 – Present	Computer Science	Johns Hopkins University Thesis Advisor: Jerry L. Prince
B.S.	2019	Computer Science	Middle Tennessee State University Summa Cum Laude, GPA 4.0

### 3 Research & Professional Experience

June 2020 – Present	Research Assistant Johns Hopkins University Baltimore, MD, USA
May 2020 – Present	Special Volunteer (Research Assistant) National Institutes of Health Clinical Center Bethesda, MD, USA
Sept 2017 – Present	Observer (Research Assistant) Vanderbilt University Nashville, TN, USA
Sept 2017 – May 2020	Research Assistant Henry M. Jackson Foundation Bethesda, MD, USA
Summer 2017	Research Intern National Institutes of Health Clinical Center Bethesda, MD, USA
May 2015 – Sept 2016	Vocal and Guitar Instructor School of Rock Franklin, TN, USA

## 4 Publications

### Journal Articles

- [1] C. Bermudez, **S. W. Remedios**, K. Ramadass, M. McHugo, S. Heckers, Y. Huo, and B. A. Landman. “Generalizing deep whole-brain segmentation for post-contrast MRI with transfer learning”. In: *Journal of Medical Imaging* 7.6 (2020), pp. 1–22.
- [2] K. G. Schilling, L. Petit, F. Rheault, **S. Remedios**, C. Pierpaoli, A. W. Anderson, B. A. Landman, and M. Descoteaux. “Brain connections derived from diffusion MRI tractography can be highly anatomically accurate—if we know where white matter pathways start, where they end, and where they do not go”. In: *Brain Structure and Function* 225.8 (2020), pp. 2387–2402.
- [3] **S. W. Remedios**, S. Roy, C. Bermudez, M. B. Patel, J. A. Butman, B. A. Landman, and D. L. Pham. “Distributed deep learning across multisite datasets for generalized CT hemorrhage segmentation”. In: *Medical Physics* 47.1 (2019), pp. 89–98.

### Conference Papers

- [1] **S. W. Remedios**, J. A. Butman, B. A. Landman, and D. L. Pham. “Federated gradient averaging for multi-site training with momentum-based optimizers”. In: *Domain Adaptation and Representation Transfer, and Distributed and Collaborative Learning*. Springer, 2020, pp. 170–180.
- [2] C. Bermudez, J. Blaber, **S. W. Remedios**, J. E. Reynolds, C. Lebel, M. McHugo, S. Heckers, Y. Huo, and B. A. Landman. “Generalizing deep whole brain segmentation for pediatric and post-contrast MRI with augmented transfer learning”. In: *Medical Imaging 2020: Image Processing*. Vol. 11313. International Society for Optics and Photonics. SPIE, 2020, pp. 111–118.
- [3] **S. Remedios**, Z. Wu, C. Bermudez, C. I. Kerley, S. Roy, M. B. Patel, J. A. Butman, B. A. Landman, and D. L. Pham. “Extracting 2D weak labels from volume labels using multiple instance learning in CT hemorrhage detection”. In: *Medical Imaging 2020: Image Processing*. Vol. 11313. International Society for Optics and Photonics. SPIE, 2020, pp. 66–75.
- [4] V. Nath, K. G. Schilling, **S. Remedios**, R. G. Bayrak, Y. Gao, J. A. Blaber, Y. Huo, B. A. Landman, and A. W. Anderson. “Learning 3D White Matter Microstructure from 2D Histology”. In: *2019 IEEE 16th International Symposium on Biomedical Imaging (ISBI 2019)*. 2019, pp. 186–190.
- [5] V. Nath, P. Parvathaneni, C. B. Hansen, A. E. Hainline, C. Bermudez, **S. Remedios**, J. A. Blaber, K. G. Schilling, I. Lyu, V. Janve, Y. Gao, I. Stepniewska, B. P. Rogers, A. T. Newton, L. T. Davis, J. Luci, A. W. Anderson, and L. B. A. “Inter-scanner harmonization of high angular resolution DW-MRI using null space deep learning”. In: *International Conference on Medical Image Computing and Computer-Assisted Intervention*. Springer. 2019, pp. 193–201.
- [6] **S. Remedios**, S. Roy, J. Blaber, C. Bermudez, V. Nath, M. B. Patel, J. A. Butman, B. A. Landman, and D. L. Pham. “Distributed deep learning for robust multi-site segmentation of CT imaging after traumatic brain injury”. In: *Medical Imaging 2019: Image Processing*. Vol. 10949. International Society for Optics and Photonics. SPIE, 2019, pp. 68–75.

- [7] V. Nath, **S. Remedios**, P. Parvathaneni, C. B. Hansen, R. G. Bayrak, C. Bermudez, J. A. Blaber, K. G. Schilling, V. A. Janve, Y. Gao, Y. Huo, I. Lyu, O. Williams, S. Resnick, L. Beason-Held, B. P. Rogers, I. Stepniewska, A. W. Anderson, and B. A. Landman. “Harmonizing 1.5T/3T diffusion weighted MRI through development of deep learning stabilized microarchitecture estimators ”. In: *Medical Imaging 2019: Image Processing*. Vol. 10949. International Society for Optics and Photonics. SPIE, 2019, pp. 173–182.
- [8] **S. Remedios**, D. L. Pham, J. A. Butman, and S. Roy. “Classifying magnetic resonance image modalities with convolutional neural networks”. In: *Medical Imaging 2018: Computer-Aided Diagnosis*. Vol. 10575. International Society for Optics and Photonics. SPIE, 2018, pp. 558–563.

## Oral Presentations

- [1] *Federated gradient averaging for multi-site training with momentum-based optimizers*. MIC-CAI DCL, Lima, Peru. Oct. 4, 2020.
- [2] *Obtaining a trained 2D deep learning model with 3D weak volume labels using multiple instance learning for CT hemorrhage detection*. NCA TBI Research Symposium. Bethesda, MD, USA. Mar. 6, 2020.
- [3] *Extracting 2D weak labels from volume labels using multiple instance learning in CT hemorrhage detection*. SPIE Medical Imaging, Houston, TX, USA. Feb. 18, 2020.
- [4] *Distributed deep learning for robust multi-site segmentation of CT imaging after traumatic brain injury*. SPIE Medical Imaging, San Diego, CA, USA. Feb. 19, 2019.
- [5] *Classifying magnetic resonance image modalities with convolutional neural networks*. SPIE Medical Imaging, Houston, TX, USA. Feb. 14, 2018.
- [6] *Deep Learning for Classification of Magnetic Resonance Brain Images*. NIH Clinical Center SIP RADIS, Bethesda, MD, USA. Aug. 9, 2017.

## 5 Professional Activities

### Reviewer Positions

- Journal of Medical Imaging
- Journal of Remote Sensing
- Journal of Electronic Imaging

## 6 Awards and Honors

2020 – 2025	NSF Fellow
Sept 2020	Best Healthcare Hack: Flow-validated COVID-19 segmentation Prize: Bose Frames Audio Sunglasses Hophacks 2020, Johns Hopkins University Baltimore, MD, USA
May 2019	Outstanding Performance in Computer Science: Senior Middle Tennessee State University Murfreesboro, TN, USA
Nov 2018	Best Use of MicroStrategy API: Live data visualization for mobile insights Prize: Nintendo Switch VandyHacks 2018, Vanderbilt University Nashville, TN, USA
2018	Barry Goldwater Scholarship 2018: Honorable Mention
May 2018	Outstanding Performance in Computer Science: Junior Middle Tennessee State University Murfreesboro, TN, USA
Summer 2017	Best Presentation of Research in Imaging 2017 SIP RADIS Oral Presentation Competition, NIH Clinical Center Bethesda, MD, USA
Summer 2017	Best Poster Award: Machine learning applications for brain MRI 2017 SIP Poster Session, NIH Clinical Center Bethesda, MD, USA
May 2017	Outstanding Performance in Computer Science: Sophomore Middle Tennessee State University Murfreesboro, TN, USA
Feb 2017	2nd Place Winner: Recommending parking locations via probabilistic models HackMT 2017, Middle Tennessee State University Murfreesboro, TN, USA
Jan 2017	Best use of MongoDB: Markov chains to create Hackathon Ideas BoilerMake IV, Purdue University West Lafayette, IN, USA
Nov 2016	Best education hack: Genetic algorithms to generate music HoyaHacks 2016, Georgetown University Washington D.C, USA
Fall 2016	1st place winner ACM Code Contest 2016, Middle Tennessee State University Murfreesboro, TN, USA