Colin B. Hansen

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PROFESSIONAL SUMMARY

I am a rising 4th year computer science graduate student at Vanderbilt University. My research is based in diffusion weighted MRI acquisition harmonization, and relies on both traditional machine learning techniques and deep learning models. Through industry experience, I'm looking to improve my coding ability and focus my research direction.

PROGRAMMING SKILLS

- Experienced in Python, PyTorch, SLURM, MATLAB

HONORS AND AWARDS

- **IBM Graduate Fellowship,** Vanderbilt University, 2017
- **Trustee Scholarship,** Buena Vista University, 2013

EDUCATION

Vanderbilt University, Nashville, TN
Ph.D. Computer Science   2017 - Current
Relevant Courses –Deep Learning for Medical Image Computing, Quantitative Medical Image Analysis, Machine Learning, Reinforcement Learning, Advanced Image Processing, Cloud Computing, Distributed Systems

Buena Vista University, Storm Lake, IA
B.S. Computer Science, summa cum laude   2017

WORK AND RESEARCH EXPERIENCE

Vanderbilt University, Nashville TN
Research Assistant, Medical-Image Analysis and Statistical Interpretation Lab   June 2018 - Current
- Developing and analyzing methods that enhance diffusion MRI acquisitions

Siemens Healthineers, Malvern PA
Image Analytics Intern   May 2019 - August 2019
- Developed deep learning methods as a part of a computer aided diagnosis system targeting lung cancer diagnosis.

Vanderbilt University, Nashville TN
Teaching Assistant, Department of Electrical Engineering and Computer Science
CS 2201 – Program Design and Data structures   Sept. – May 2018
- Provided feedback and graded programming projects and course exams
- Held 4 hours weekly office hours

PROJECTS

Deep Learning Harmonization   Jan. 2019 – Current
- Developing several 3D deep learning models with the goal of capturing scanner specific effects while predicting a subject's acquisition from one scanner given the acquisition from another
- Using PyTorch v0.4.1 on a high-performance computing cluster with Nvidia Titan X GPUs

Null-space Tuning   Dec. 2018 – Current

- Showing that equivalence classes can be leveraged with a triplet loss in a semi-supervised framework for classification maintaining accuracy with state-of-the-art architectures while reducing the annotated training set by 40%
- Using PyTorch v0.4.1 on a high-performance computing cluster with Nvidia Titan X GPUs

Diffusion Harmonization Pipeline   Nov. 2018 – Current
- Integrating and analyzing the impact of recently developed techniques for diffusion MRI scanner harmonization

Characterization of Variation in CSF   May 2018 – Aug. 2018
- Modeled and analyzed the variation in the diffusion signal in cerebral spinal fluid regions of the brain and the correlation with scan parameters

Spatial Signal Drift Correction   Sept. 2017 – June 2018
- Proposed a method for correcting spatially varying signal drift that affects demanding diffusion MRI acquisitions

JOURNAL PUBLICATIONS

Colin B. Hansen, Vishwesh Nath, Allison E. Hainline, Kurt G. Schilling, Prasanna Parvathaneni, Roza G. Bayrak, Justin A. Blaber, Okan Irfanoglu, Carlo Pierpaoli, Adam W. Anderson, Baxter P. Rogers, Bennett A. Landman. "Characterization and correlation of signal drift in diffusion weighted MRI." *Magnetic resonance imaging* (2019), 57, pp. 133-142.

CONFERENCE PUBLICATIONS

Colin B. Hansen, Vishwesh Nath, Allison E. Hainline, Kurt G. Schilling, Prasanna Parvathaneni, Roza G. Bayrak, Justin A. Blaber, Owen Williams, Susan Resnick, Lori Beason-Held, Okan Irfanoglu, Carlo Pierpaoli, Adam W. Anderson, Baxter P. Rogers, Bennett A. Landman, "Consideration of Cerebrospinal Fluid Intensity Variation in Diffusion Weighted MRI." SPIE Medical Imaging, San Diego, CA, 2019

Colin B. Hansen, Yiyuan Zhao, Halid Yerebakan, Luca Bogoni, Anna Jerebko, "False positive reduction of vasculature for pulmonary nodule detection." SPIE Medical Imaging, Houston, TX, 2020