# 2020 Alzheimer's Disease & Related Disorders Research Day

Response was added on 02/03/2020 3:30pm.

Poster Abstract Submission Form

All abstracts must be submitted online by completion of business day on February 3, 2020. For questions regarding the application process, please email Sheryl Spensley.

Poster applicants are encouraged to register for the free Alzheimer's Disease & Related Disorders Research Day, which will be held at the Discovery Building on the UW-Madison campus on March 5, 2020.

Members of the Alzheimer's Disease & Related Disorders Research Day Committee will review abstract submissions. The committee will invite a few abstract presenters to give podium presentations at the event. Selected applicants will be notified by February 10, 2020. Poster award winners will be announced on the day of the event. Awards will be given for the following categories: Best Undergraduate Research Poster; Best Graduate Student or Research Specialist Poster; and Best Fellow, Post Doc, or Research Scientist Poster.

Please note that poster boards at the Discovery Building are 46 inches by 46 inches.

## Poster Information

Abstract title: Towards Automated Cranial 4D Flow MRI Analysis

Author(s): Carson Hoffman, Grant Roberts, Sara Berman, Laura Eisenmenger, Oliver Wieben

Category
⊗ Biology/Physiology
◯ Health and Social Services
◯ Pharmacology
◯ Neurosciences
◯ Social and Behavioral Sciences
◯ Social Policy
◯ Care Research/Clinical Practices
◯ Other

www.projectredcap.org

REDCap

Abstract. Please paste the text of your abstract in the text field. Please keep the word count under 250 words. A Background/Methods/Results/Conclusion format is preferred. Photos and other graphics will not be accepted.

Background: 4D Flow MRI enables detailed, multi-segmental flow analysis of the whole brain; however, complex cranial vasculature leads to long post-processing times. We have simplified our previously established semi-automated analysis pipeline to allow for robust and repeatable measures, providing users with the ability to easily visualize and quantify complex cranial 4D flow datasets.

Methods: Ten cranial 4D flow MRI scans were acquired on healthy controls after subject consent and IRB approval. An interactive 4D flow processing tool was implemented in MATLAB-2018b (Mathworks, Natick, MA) that provides improved angiograms, centerline generation, vessel selection, automated background phase correction, visualization, and reduced computer memory requirements. A quantitative flow comparison was completed between the original and new in-house tools assessing vessel selection, repeatability, time, memory, and precision of flow.

Results: The number of missed vessels reduced from 16.2% to 3.8%. The angiogram generation and centerline labeling times decreased from 48.6 to 13.2 sec. The vessel selection and pulsatile flow verification times decreased from 15.2 to 5.0 min (1.17 and 0.38 min per plane), respectively. The average percent error in local flow quantification was $2.8\pm2.6\%$ for the old tool and $2.9\pm2.2\%$ for the new tool.

Conclusion: We have successfully added additional post-processing functionality and visualization while reducing the time needed for completing a multi-vessel cranial analysis. The new 4D Flow analysis tool provided angiograms and centerlines with improved vessel visibility and selection capabilities, especially for short and small vessel sections.

List up to 5 keywords describing your area of research/scholarly work:

4D flow; segmentation; cerebrovascular; blood flow; pulsatility

---

## Presenting Author Information

First name: Grant

Last name: Roberts

Department/Affiliation: Medical Physics

Email address: gsroberts@wisc.edu

Phone number: (816) 863-8282

The presenting author is:
- ○ Faculty
- ○ Fellow, post doc, or research scientist
- ⊗ Graduate student or research specialist
- ○ Undergraduate student
- ○ Other

www.projectredcap.org

**REDCap**