

[CZ-1] Deep Learning Alzheimer's Disease Diagnosis

**CS 4850
Sections 02 & 04
Fall 2025
Sharon Perry
Aug 28, 2025**



Julia Johnson
Developer



Jordan Rainford
Developer

Team Members:

Name	Role	Cell Phone / Alt Email
Jordan Rainford (Team Leader)	Developer	404.277.6285 Jrain.dev@outlook.com
Julia Johnson	Developer	404.956.2715 cjohnson.julia120@gmail.com
Chen Zhao	Project Owner	470.578.6005 czhao4@kennesaw.edu

Project Overview / Abstract (Research)

Alzheimer's disease is a regrettably common neurological disorder which has posed significant scientific challenges for early and accurate diagnosis. Traditional diagnostic approaches often rely on cognitive assessments and clinical evaluation, which may not fully capture subtle changes in brain structure that occur during early stages of the disease's progression. This makes it difficult for clinicians to provide interventions early, which has been proven to be the best time to administer treatment. Given the rising prevalence of Alzheimer's worldwide and its profound impact on patients, families, and healthcare systems, there appears to be a critical need for more effective tools to prevent progression of the disease with higher accuracy.

To address this challenge, our project focuses on integrating deep learning techniques with magnetic resonance imaging (MRI) data in order to enhance the accurate prediction of Alzheimer's stages. By combining advanced computational models with medical imaging, we aim to identify patterns and markers that may not be detectable by human observation. In addition to MRI analysis, we will incorporate electronic health record (EHR) data, which provides valuable clinical context and patient history. This integration of multimodal data allows for a more comprehensive approach to disease staging, thereby improving the predictive power of the model.

Our methodology will include rigorous preprocessing of MRI scans and EHR datasets to ensure data quality and consistency, followed by the development and training of a deep learning model optimized for accuracy.

Through this work, we seek to contribute to a deeper understanding of AD progression and its underlying neural signatures. Ultimately, our goal is not only to improve diagnostic and prognostic capabilities but also to provide clinicians with critical tools that can inform personalized treatment plans, support early treatment strategies, and improve long-term outcomes for individuals affected by the Alzheimer's disease.

Project website

<https://sites.google.com/view/cz-1-alzheimers-project/home>

Deliverables - Specific To Your Project

- Team/Project Selection document (Individual Assignment)
- Weekly Activity Reports (WARs – Individual Assignment)
- Team Status Report (TSR – Group Assignment)
- Peer Reviews (Individual Assignment)
- Project Plan (Group Assignment)
- SRS, SDD, STP & Dev Doc (Group Assignment)
- Prototype Presentation for Peer Review (Group Assignment)
- Final Report Package (Group Assignment)
 - Final Report (Group Assignment)
 - Source Code (Group Assignment)
 - Website (Group Assignment)
 - Video Demo (Group Assignment)
- C-Day Application/Submission
- IEEE Research Paper

Group Meeting Schedule Date/Time

We are meeting as a group on Wednesdays at 6:15pm. We will schedule meetings with our Research Supervisor at a later date.

Collaboration and Communication Plan

We are planning to meet every week on Wednesday afternoons at 6:15pm. We are primarily communicating via Teams, emails, and through texting. We will have in-person meetings as needed throughout the course of the

project.

Project Schedule and Task Planning

We will utilize a Gantt chart to track our progress on the project. We reserve the right to make changes to the project plan, as well as to change the way that we track progress throughout the project timeline. Any changes to the chart will be communicated in a documentable medium (Teams, Email, Text, etc.) before the changes go into effect.

CZ-1 Alzheimer's Disease																		
Project Name:		Diagnosis																
Report Date:		8/31/2025																
Phase	Tasks	Complete%	Current Status Memo	Assigned To	Milestone #1	Milestone #2	Milestone #3	C-Day										
Requirements	Meet with stakeholder(s) SH	50%	Delayed but complete	Julia, Jordan	09/02 5	09/09 10	09/16 3	09/23 3	09/30	10/07								
	Define requirements	10%		Jordan					10/14	10/21								
	Review requirements with SH	0%		Julia, Jordan					10/28	11/04								
	Get sign off on requirements	0%	Will add more figures	Julia, Jordan					11/11	11/18								
Project design	Define tech required *	0%		Julia					11/25	12/02								
	Database design	0%		Julia, Jordan														
	Model Design	0%		Julia, Jordan														
	Front End Design	0%		Iordan														
	Develop working prototype	0%		Julia, Jordan														
	Test prototype	0%		Julia														
Development	Review prototype design	0%		Julia, Jordan														
	Rework requirements	0%		Julia, Jordan														
	Document updated design	0%		Julia, Jordan														
	Test product	0%		Jordan														
Final report	Presentation preparation	0%		Julia														
	Poster preparation	0%		Jordan														
	Final report submission to D2L	0%		Julia, Jordan														
	and project owner																	
		Total work hours	323		8	23	12	44	39	35	40	27	25	10	15	25	15	5

* formally define how you will develop this project including source code management

Version Control Plan

We will utilize Git and GitHub for version control and collaboration with teammates. Any and all changes to the main branch will be communicated in a documentable medium (Teams, Email, Text, etc.) before the changes go into effect.

To ensure our software is up to date, we will periodically retrain our model on updated datasets to ensure that the prediction is as accurate as possible. We will also update our code as needed as our platforms and the Python language change over time.