

# Using MongoDB and Mongoose with a MEAN Stack Implementation of the NEXUS-PORTAL-DOORS System

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## Introduction

For researchers, primary research is only the first stepping stone to proving or disproving a theory. One successful experiment proves little to nothing in the grand scheme of the scientific community. However, the weakness of a single experiment is covered by the power of the meta-analysis, usually completed by a third party. Meta-analysis requires researchers to analyze results from multiple primary articles and assess whether or not the result is accurate, show if the hypothesis presented are proven or disproven, and provide a degree of error. However, despite the necessity of meta-analyses, it continues to be time consuming and ineffective at connecting with all points of data. The miniscule amount of secondary articles pale in comparison to the literal thousands of primary articles which are published each day. In order to take advantage of all the new information which is provided and to create more effective secondary analyses, a semantic web solution provides the necessary tools in order to take full statistical advantage that meta-analysis offers.

In order to support PORTAL registries and DOORS directories, a database is necessary in order to support and store the data. In order to take full advantage of a tried and true framework, MEAN stack serves as the ideal system by thoroughly integrating client-side, server-side, and database processes.

## Methods

For this new NEXUS-PORTAL-DOORS (NPD) system implementation, MEAN (MongoDB, Express, Angular, Node.js) stack is the most updated and contributed fullstack javascript framework. Both backend and front end will rely heavily on node.js, an open-source runtime environment which enables scalable web applications and servers. Used with Express and other packages, node.js enables the user to organize a web application into a MVC (model-view-controller) architecture. In accordance with the "M" from MEAN stack, MongoDB serves as the database for the NPD. However, MongoDB acts only as a database, offering a bare minimum in regards to complex and automated queries. Mongoose enables connection to a MongoDB database from javascript, allowing model abstraction, large scale queries, data

validation, and more. It also creates an SQL style database through schemas, creating a structured system in a NoSQL database.

Timeline:

- Week 1-2: Create read/write MySQL database from MicrosoftSQL
- Week 3-4: Set up PORTAL system for database
- Week 5-6: Set up DOORS system for database
- Week 7-8: Connect with other modules
- Week 9-10: Test reliability, accuracy, full extent of analysis

## Results

Table 1 summarizes the sample sizes and demographics for each of the selected subgroups of patients analyzed in the study cohort.

## Discussion

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## Conclusion

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## Acknowledgments

Do not acknowledge co-authors; only acknowledge persons who have contributed to or otherwise supported the study in some way but did not get recognized as a co-author. Acknowledgments are also used to identify any outside funding sources other than the affiliated institution identified for authors.

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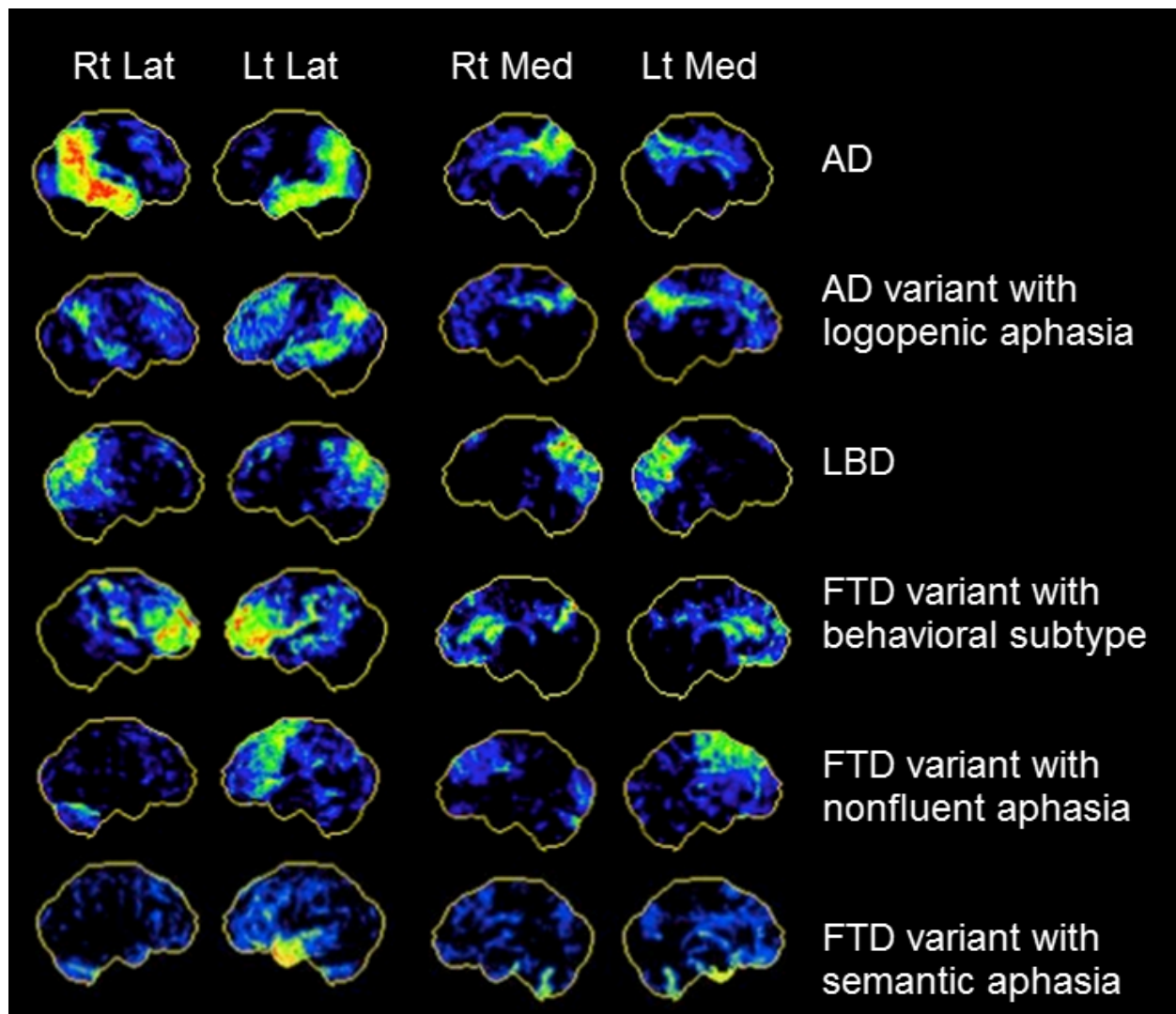


Figure 1: FDG-PET scan patterns displayed in NeuroStat 3D-SSP for focal onset dementias.

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Table 1: Patient Demographics for Selected Subgroups in Study Cohort  
 Subgroup selected by diagnostic marker

Subgroup Id	Description	N	Sex		Age at PET Scan	
			Male	Female	Median	Min – Max
1	C11-PiB Imaging AD	51	27	24	65	53 – 81
2	F18-FDG Imaging AD	49	22	27	65	53 – 81
3	Clinical AD	24	13	11	69	56 – 81
4	Clinical PPA-L (AD variant)	19	7	12	67	53 – 78
5	Clinical PPA-G	16	12	4	71	48 – 80
6	Clinical PPA-S	13	8	5	64	54 – 77
7	Clinical CBS	14	6	8	64	57 – 73
8 (pooled 3–4)	Clinical AD & PPA-L	43	20	23	69	53 – 81
9 (pooled 5–7)	Clinical PPA-G, PPA-S & CBS	43	26	17	66	48 – 80
10	Entire cohort	94	52	42	68	37 – 81