

Summer 2019

Research the geometry of the brain (Part 1)

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Computer and Information Science Undergraduate Project Topics and Ideas

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Title:

Part 1: Research the geometry of the brain and how it uses triangulation, similar to a GPS, to compartmentalize information for memory storage, allocation and retrieval

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Difficulty:

Moderate

Specialization:

Artificial Intelligence

If other, please specify:

Most Appropriate Course:

Project I

Brief Description:

We want to explore how the brain creates meaning, understanding and allocates information into memory. From groups we distinguishes patterns and generalizes patterns into concepts. Does the brain use triangulation? Is there a trivariant system analogous to covariants? Why does pattern recognition require three elements? What is memory? What is the geometry of the brain?

Number of students needed:

3

Outcomes and Deliverable:

Part 1 is a research phase answering the questions above.

Skills Required:

Part 1 requires research with mathematical and analytical skills. You should approach the project as a generalist with a willingness to catalog an array of different subject areas in an effort to distinguish how the brain creates groups, patterns and concepts. You should be willing to explore new ideas, be willing to make errors, and understand/learn how to work independently, in partnership, and in a group environment.

Available Resources:

Research using library resources and the World Wide Web.

Program Goal:

CISC 1.1: Mathematical Analysis, CISC 1.2: Sound Reasoning, CISC 1.3: Develop Solution CISC 2.2: Software Platform, CISC 2.4 Data Structure, CISC 2.5 Analysis of Algorithms CISC 3.1: Explore New Methodologies, CISC 3.2: Explore New Design CISC 4.1: Written Communication, CISC 4.2: Oral Communications CICS 5.1: Collaborative Work Practices

Student Learning Outcomes:

1a: The student should be able to analyze a problem in a manner that facilitates the design of its solution., 2a: Student is able to create a formal software design based on a given set of requirements., 3a: Student will be able write in a standardized format in order to organize their thoughts and deconstruct their ideas at a level appropriate for the desired audience., 3b: Student will be able to verbally communicate effectively with an advisor, group of colleagues or an audience to express a thought or idea at a level appropriate for the desired audience., 4a: demonstrate understanding of legal and ethical principles., 5a: Ability to organize tasks, contribute a fair workload, and see tasks to completion., 5b: Ability to collaborate as an effective team member., 5c: Ability to manage challenges and initiate actions to solve a challenge.