**Introduction**

**Motivation**
- Creation of computerized models of the brain will hopefully lead to better understanding of the brain and aid in the treatment of neurological diseases such as Hydrocephalus, Alzheimer’s, Parkinson’s, Autism.
- Computerized models should allow for less animal usage, time and cost savings.
- Computerized models of the brain should make new simulations possible that would otherwise be impossible.
  - Improved diagnosis for
    - Abnormal vascular structures (tumors)
    - Stroke conditions

**Objective**
- Create 3 dimensional images of various regions of a rat brain using MRI’s of a rat brain and image reconstructing software called Mimics.

**Process**

- A Sterotaxic Atlas of the Rat Brain was used to identify various regions of the Brain and cross referenced with MRI’s of Rat Brains that have been downloaded into the Mimics Software. Desired regions are highlighted in the Mimics software and 3D image is produced.

**Reconstructed Three-dimensional Brain Images**

**Conclusion**

Functional computerized models of the brain geometry may prove to be useful in developing a better understanding of the brain and hopefully aid in the treatment of neurological diseases. Creating these images may be some of the first steps in creating these models. Further work will need to be done to apply mathematical equations to these images that will simulate fluid behavior of the brain. Additionally once these computerized models of the brain are developed actual experimental models on animals and humans will need to be performed.

**Teaching Module Plan**

**Electric Field**
- In physics students will be taught of real life applications of electric fields to develop possible treatment methods for the brain such as the volume sensor probe.

**Communications in mathematics**
- Many students struggle to find connections to real life and mathematics. Students will be presented with many math applications to current real life issues such as medicine, environmental and biological.

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