

Modeling Disease in the Human Brain with Geometry and Imaging

Geometry, Imaging and Computing

Ronald Lok Ming Lui, David Xianfeng Gu

Abstract: The highly folded surface of the human brain is difficult to visualize and analyze. The development of these folding patterns is not fully understood and there is debate in the biological and neuroscientific communities as to why folds develop in a particular location. Additionally, there are many diseases involving the folding the patterns of the brain that occur in early development and causes of these diseases are not understood. I will discuss some mathematical and computational models we have developed using a prolate spheroid domain to gain insight into cortical folding pattern formation. I will also discuss how conformal mapping can assist with the study and analysis of diseases in the human brain.

Monica K. Hurdal

Department of Mathematics

Florida State University, Tallahassee, FL 32308, U.S.A.

`mhurdal@math.fsu.edu`