

# **Three-Dimensional Visualization with Large Data Sets: A Simulation of Spreading Cortical Depression in Human Brain**

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## **Abstract**

We developed 3D simulation software of human organs/tissues; we developed a database to store the related data, a data management system to manage the created data, and a metadata system for the management of data. This approach provides two benefits: first of all the developed system does not require to keep the patient's/subject's medical images on the system, providing less memory usage. Besides the system also provides 3D simulation and modification options, which will help clinicians to use necessary tools for visualization and modification operations. The developed system is tested in a case study, in which a 3D human brain model is created and simulated from 2D MRI images of a human brain, and we extended the 3D model to include the spreading cortical depression (SCD) wave front, which is an electrical phenomenon that is believed to cause the migraine.