Team: Ceres

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Project: GUI interface for large data stream analysis for all-sky astronomical measurements.

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CERES

Introduction

- Studying small bodies such as asteroids and comets yields useful knowledge

    - Formation of the Solar System

    - Eventuality of an asteroid impact on Earth

- Limited by an astronomical amount of data and no interface to analyze it

- This creates a data science problem for us to solve

Project Sponsors

- David Trilling - Professor

  - Astronomy and Planetary Science

- Michael Gowanlock - Assistant Professor

  - School of Informatics, Computing, and Cyber Systems

Current Issues with Existing Interfaces

- No interface currently exists to access information in database

- Obscured data points have little meaning for anyone inexperienced

- Queries are run by one person to gather the requested information

  - Completely manual approach, not user-friendly

  - Due to the large amount of data being processed, the time to execute a query could be slow

Team Ceres' Solution

- Develop an approach to visualizing and searching large amounts of data, split into two parts

    - An API backend for search algorithms and queries

    - A web interface frontend for data visualization

- Develop a way to transfer existing data to a more responsive database engine

    - Scheduled batch job that automatically inserts new rows from a sqlite3 database file into different tables in a Microsoft SQL Server instance

    - Maintain integrity of existing db schema

Development Plan

- Weekly Client Meetings

- Gain a better understanding of the current database implementation

  - Design and scale

- Continued design of a Web Interface and a REST API

  - Visualization tools and predefined search algorithms

Summary

- Big Data Revolution is coming to Astronomy

  - There is no existing interface

- Tools for analyzing the data need to be developed

  - Manual analysis will be an insurmountable task