PRAS-DT: Portable, Reliable, and Automatic Streaming Data Transfer

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Dr. Rosa Filgueira

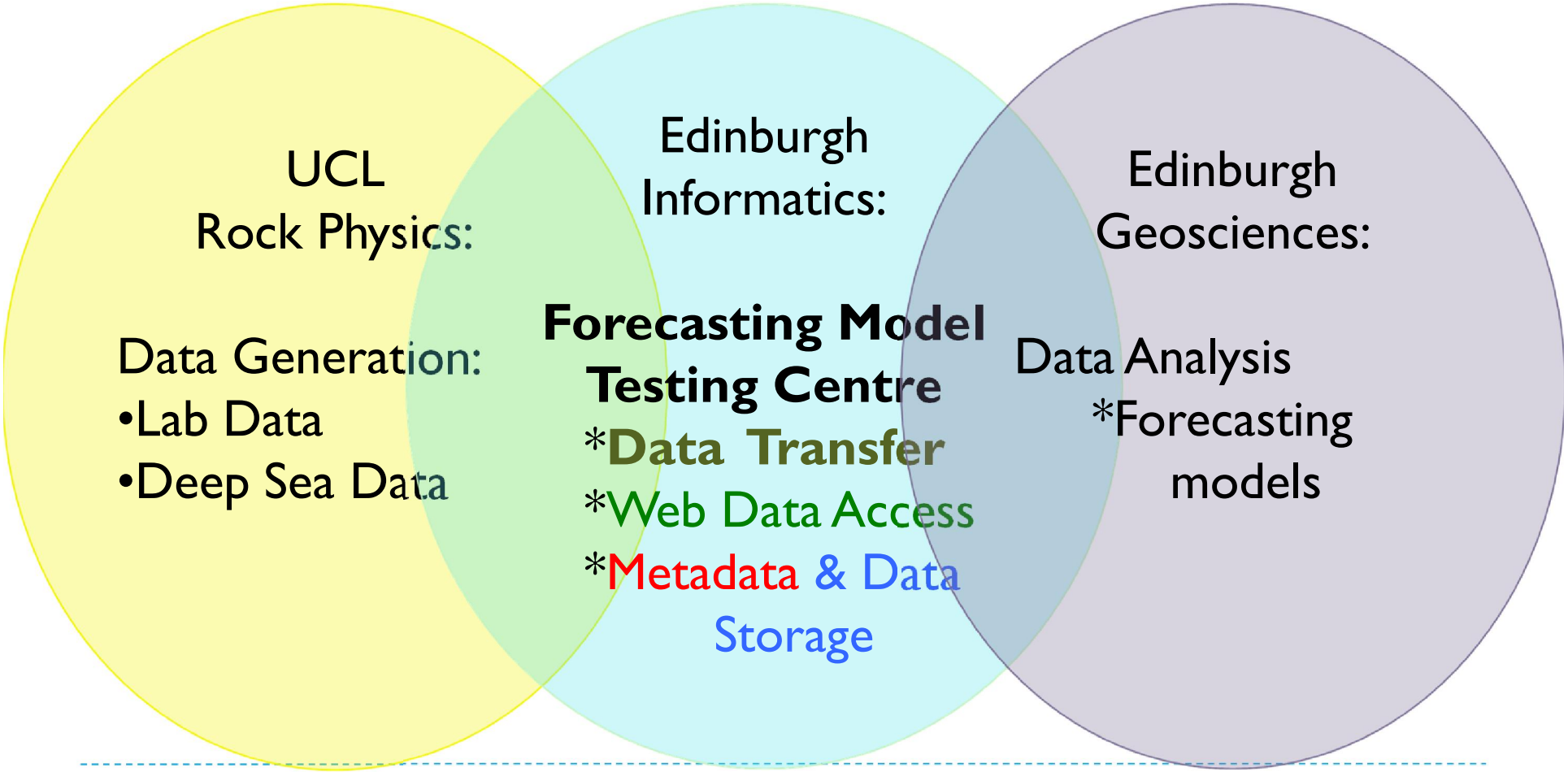
OSDC PIRE Fellowship

- Four week internship
- University of Edinburgh, School of Informatics
- Dr. Rosa Filgueira – The Effort Project

EFFORT goals

- To determine the **predictability** of brittle failure of rock samples in the **laboratory experiments.**
- To determine how this **predictability** scales to the greater complexity, physical size, and slower strain-rates of **natural-world** phenomena.
- To develop a **Forecasting Model Testing Centre** for archiving and monitoring Rock Physic data.

EFFORT roles and tasks



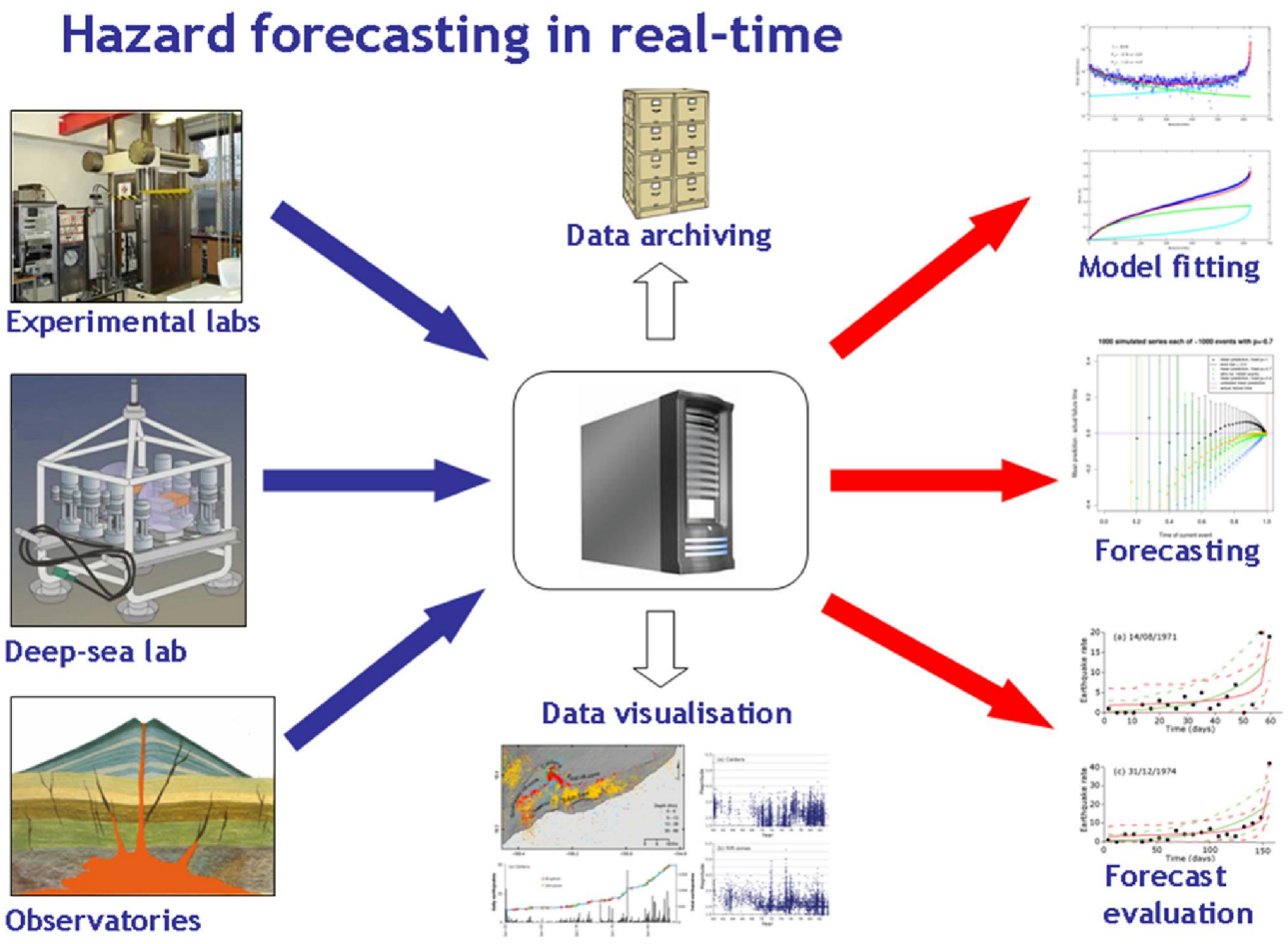
EFFORT experimental data

- Experiments at UCL- Rock Physics Laboratory
  - Data focus for the internship
- Deep- sea experiments, produced by the Creep2 project
- Synthetic data
- Volcanic data

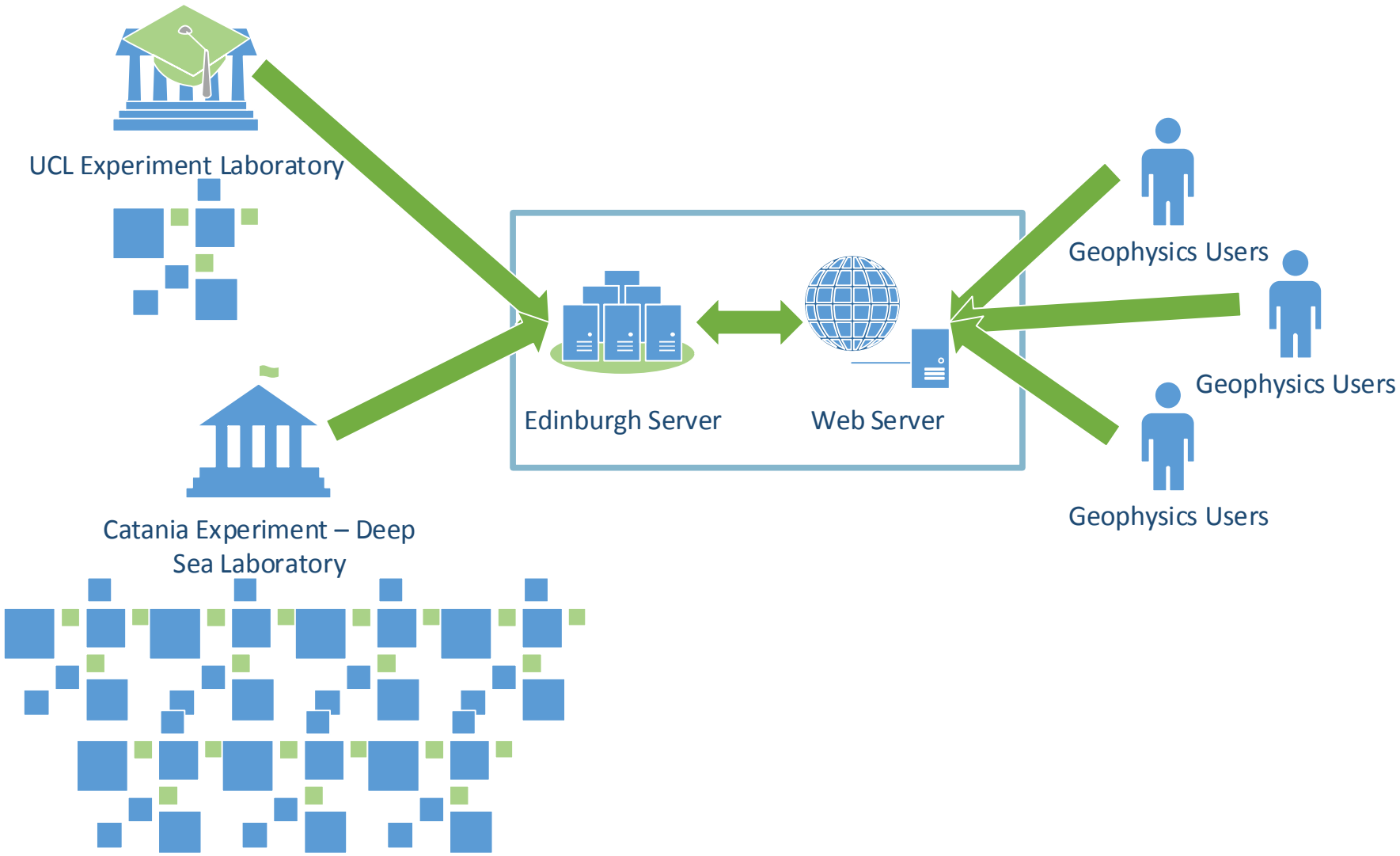
Experiments at UCL- Rock Physics Laboratory

- Data Transfer features of UCL laboratory experiments
- Time Driven Data (TDD) – up to 500 KB/Day
  - Every day a new TDD file is generated. Every minute, this file is modified with new information. This file must be synchronized to Edinburgh resources every minute.
- Acoustic Emission (AD) Data – up to 75KB/Day
  - As soon as the rock (sample) starts to break, an AD file is generated per day. This file is updated during small intervals (microseconds). This file must be synchronized to Edinburgh resources every minute.
- The duration of an experiment is undefined. The last one was 45 days. Could be longer.

Data Transfer Outline



The EFFORT Project Data Outline



Data Transfer challenges
Controlled laboratory experiments

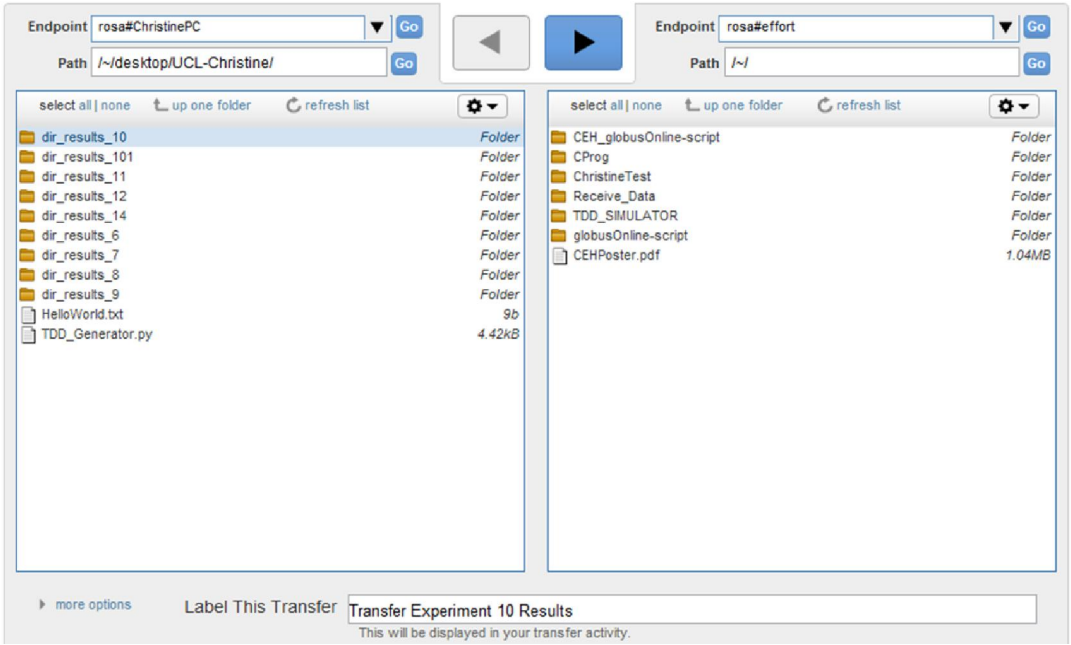
- Chose and set up a mechanism on the server machine to receive data from UCL and Catania.
- Necessary Characteristics:
  - Automatic, without human interaction.
  - Compatible with different operating systems:
    - Host machines: Windows
    - Server machine: Linux (Debian)
  - Support sending data every minute over along period of time.
  - Ability to catch up with transfers if there has been an intermission in connection, a reboot or a data loss.

Data Transfer solutions

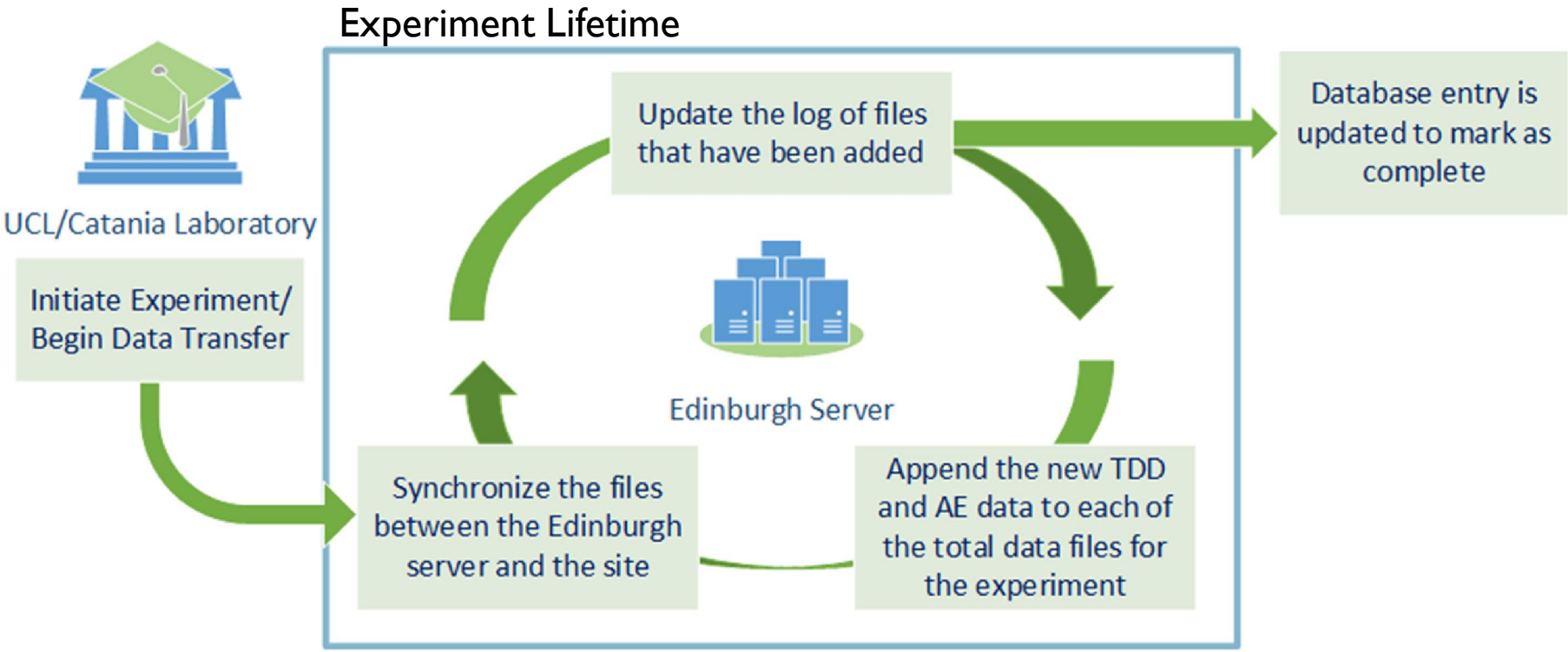
- First prototype:
  - Run two scripts periodically (one in host and other in the server machine) using a winscp tool and SFTP protocol.
  - The host machine initiates the data transfer.
- Second prototype:
  - Run a periodically script in the server machine to transfer the data with Globus Online
  - The server machine initiates the data transfer
  - PRAS-DT: Portable reliable adaptive streaming data transfer

PRAS-DT

- Globus Online
  - Fast setup time
- Automated Script
  - Run for length of experiment



PRAS-DT


Experiment Lifetime
UCL/Catania Laboratory
Initiate Experiment/
Begin Data Transfer
Update the log of files
that have been added
Database entry is
updated to mark as
complete
Edinburgh Server
Synchronize the files
between the Edinburgh
server and the site
Append the new TDD
and AE data to each of
the total data files for
the experiment

Project Outcomes

- Poster presentation at Supercomputing 2012
  - Education Program
- MITRE interview presentation
- Continued work by Dr. Filgueira

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