

GPUnit

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Overview

AMUSE Introduction

Purpose

- Purpose of GPUnit

- Target Audiences

Components and Features

- Experiment Management

- Diagnostics

- Command Line Interface

- Parallelism and Distribution

User Interface

- Cluster Control

- Cluster Control

- Module Specification

Final Goals

Astrophysical Multipurpose Software Environment (AMUSE)

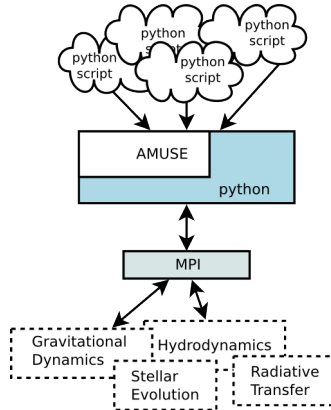


Figure: AMUSE Architecture

State of AMUSE

- ▶ Currently used by researchers to run large-scale simulations.
- ▶ Scripts, diagnostics, logging are all written by hand.
- ▶ AMUSE API/programming knowledge is required to create experiments.

Purpose of GPUnit

- ▶ Ease the use of AMUSE
- ▶ Create/Design/Modify experiments
- ▶ Select, configure, swap out modules and initial conditions

Target Audiences

- ▶ Physics Students
- ▶ Observational Astrophysicists
- ▶ Theoretical Astrophysicists

Experiment Management

- ▶ Experiments include a specification for:
 - ▶ Initial Conditions, Variables
 - ▶ Module Selection
 - ▶ Logging
 - ▶ Diagnostics
- ▶ Allows experiments to be repeated and shared.

Diagnostics

- ▶ Diagnostics read the state of the system while it is computing, and output selected metrics.
- ▶ Features include:
 - ▶ Configurable output data formats
 - ▶ Sensible default diagnostics provided
 - ▶ An interface to create custom diagnostics
- ▶ Diagnostics can include a visual display of the system state.

Command Line Interface

- ▶ The command line interface gives the user ability to:
 - ▶ Make small changes to the experiment before running
 - ▶ Run headless experiments
 - ▶ Control experiment distribution across a cluster
 - ▶ Easily repeat experiments

Parallelism and Distribution

- ▶ Modules are independent, can run at the same time.
- ▶ No need to share data until the end of a time interval.
- ▶ Some exceptions if a special event occurs
- ▶ User interaction can be required.
- ▶ GUI will provide a display of all nodes on the cluster.
- ▶ Command line provides a list of free nodes if desired.

Experiment Editor

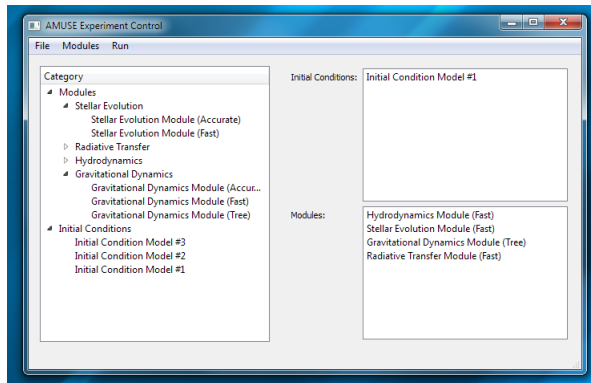


Figure: Experiment Editor

Cluster Control

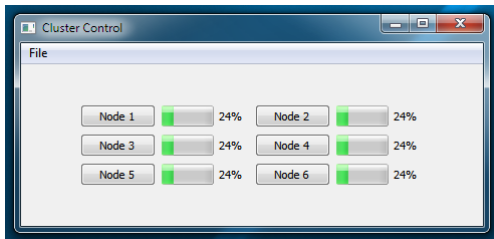


Figure: Cluster View

Module Specification

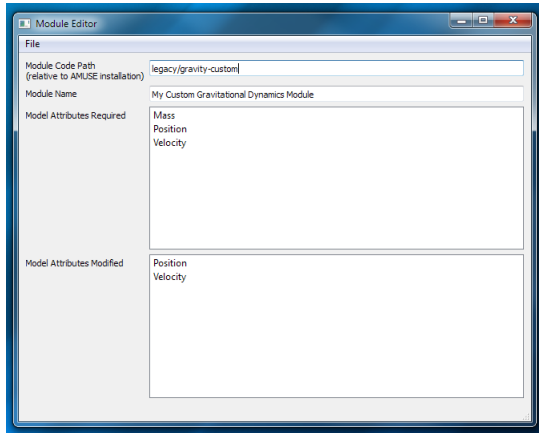


Figure: Module Editor

Final Goals

- ▶ Integration into AMUSE
- ▶ Users can download AMUSE and create/run experiments right away.
- ▶ Open AMUSE up for use by a non-programmer audience.