GEANT-4 GPU

Software Requirements Specification

Version 0

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1 Introduction

We are using the Volere template.

2 Project Drivers

2.1 Purpose of Project

Project Background
Currently running GEANT4 simulations that require many particle takes a long time to compute when run on the CPU. By running the simulation on the GPU the user should be able to see a significant speed up in computation times

Goal of the project
The goal of this project is to port the GEANT4 code to be able to run on the GPU.

2.2 Stakeholders

3 Project Constraints

3.1 Mandated Constraints

3.2 Naming Conventions & Terminology

3.3 Relevant Facts and Assumptions

Facts

- GEANT4 is programed using C++

Assumptions

- It is assumed that the user will have an understanding of particle physics
- It is assumed that the user will know how to use GEANT4

4 Functional Requirements

4.1 The Scope of the Work

4.2 Business Data Model & Data Dictionary

4.3 The Scope of the Product

4.4 Functional Requirements

5 Non-functional Requirements

5.1 Look and Feel Requirements

5.2 Usability and Humanity Requirements

5.3 Performance Requirements

5.4 Operational and Environmental Requirements

Expected Physical Environment

- The product shall be used by an engineering Physics professor, researcher or student
- The user will be sitting down in a temperature controlled environment

Requirements for interfacing with adjacent Systems

- The product shall work with the last four versions of GEANT4

Productization Requirements

- The product shall be distributed as a ZIP file.
- The product will be available on a public repo for users to download

Release Requirements

- Later versions of the product that have been patch will be available on the public repo
- Each release shall to cause previous features to fail.

5.5 Maintainibility and Support Requirements

5.6 Security Requirements

5.7 Cultural Requirements

5.8 Legal Requirements

Compliance Requirements
N/A
Standards Requirements
N/A

6 Project Issues

6.1 Open Issues

6.2 Off-the-Shelf Solutions

6.3 New Problems

6.4 Tasks

The project life cycle will follow the deliverable outline for Computer Science 4ZP3. By April the project must be completed in its entirety.

6.5 Migration to the New Product

6.6 Risks

6.7 Costs

6.8 User Documentation and Training

- Function descriptions shall be provided for every new function.
- There shall be .txt file accompanying the project that will explain to the user the changes as well as how to use the new functions
- Users who know how to use GEANT4 should be able to easily use the new functions

6.9 Waiting Room

6.10 Ideas for Solutions