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| Tunnel-K Software Design Description (SDD) |
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| **12/1/2011** |

**Approvals**

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Team Member: Brian Pittman Date

**Revisions**

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### Scope

### Identification

Tunnel-K is an effort by graduate software engineering students at the University of Alabama in Huntsville enrolled in a two-semester Software Engineering Studio course (CPE656 and CPE658). The endeavor is aimed at building a small-scale wind tunnel and associated software systems and is intended to be used by science museums, schools, etc. for educational purposes. The work is being done in association with the Hands-On Science Center (HOSC) in Tullahoma, TN, and the team will draw upon their professional experience working as professional software engineers.

### System overview

The overall Tunnel-K system consists of a wind tunnel structure along with associated computer hardware and software, wiring, sensors, motors, fans, power supplies, etc. used for controlling and monitoring the operation of the tunnel. Additionally, a two-dimensional flow solver application suite will provide the opportunity for experimentation with various shapes in a virtual wind tunnel environment and graphically displayed mach and pressure gradients. The suite will also provide integration with the physical wind tunnel controls so that simulated conditions and be illustrated in the real world.

### Document overview

This document addresses system design issues bridging the gap between requirements and implementation. Elements in this document will tie individual requirements to their respective design issues drawing heavily on the Unified Modeling Language and existing prototypes.

### Referenced documents

* Tunnel-K Statement of Work (SOW)
* Tunnel-K Rough Order of Magnitude Estimate (ROM)
* Tunnel-K Software Requirements Specification (SRS)
* Tunnel-K Software Development (SDP)
* Tunnel-K Google Code site, <http://code.google.com/p/tunnelk>
* Tunnel-K Google Groups site, <http://groups.google.com/group/tunnelk>
* Trial-Use Standard for Information Technology Software Life Cycle Processes Software Development Acquirer-Supplier Agreement, J-STD-016-1995
* UAH CPE656 Fall 2011 Course Syllabus, Dr. Jeffry Kulick
* Code Conventions for the Java Programming Language, <http://www.oracle.com/technetwork/java/codeconvtoc-136057.html>
* Code Style Guidelines for Contributors, (Google Android Style Guide) <http://source.android.com/source/code-style.html>
* Writing a Library for Arduino, <http://arduino.cc/en/Hacking/LibraryTutorial>

### System item-wide design decisions

### Software item architectural design

### Software item components

### Concept of execution

### Interface design

### Interface identification and diagrams

### (Project-unique identifier of interface)

### Software item detailed design

### (Project-unique identifier of a software unit, or designator of a group of software units)

### Requirements traceability

### Notes

### Annexes