Project Duration: 36 months

**Research Products:** The proposed CPS: Synergy research will generate four types of artifacts: (a) research advances in the form of algorithms and prototypes of the orchestration middleware, (b) Modeling and design environment for developing the application along with a reusable library of the components, (c) data and corresponding analysis tools from various experiments, and (d) educational material that will support classroom lectures, project-based learning, and outreach efforts.

**Data Format:** Software will be generated in the form of source and compiled code in various programming languages. Experimental data will be in the form of plain ASCII text files as well as spreadsheets in Microsoft and OpenOffice format (with independent variables and dependent variables clearly marked in columns). Larger data sets will be archived and accessed from relational data bases that preserve the structure and semantics of the data. Educational materials will be in the form of HTML and PDF files and audio-visual materials will be in the form of MPEG and AVI, as well as WAV and MP3. In addition, plain text README files will be provided that contain information about the organization and format of the data (e.g., in the spreadsheets).

**Access to Data and Data Sharing Policies:** Tools developed under the project (by the Vanderbilt University team members) will be released under the MIT Open source License (<http://opensource.org/licenses/MIT>) or an equivalent license. The source code will be shared via the CPS-VO site. *Educational materials* for the courses as well as other outreach materials (e.g., presentations in PDF format) will also be made available from the PIs’ department websites and also through the CPS-VO portal

Regarding the data set, we will work with the Nashville Fire Department to sanitize the data and then create a synthetic derivative that preserves the characteristics of the data but does not expose the proprietary information. This cleansed data trace will be made available on the CPS-VO site.

The PIs and project personnel will develop and control the core *software components* released under this project. A central project data repository will be maintained at our ISIS Projects server to store and maintain all project work products. The Projects server runs both SVN and GIT version control software. The project server is backed up using a disk-to-disk system to facilitate fast and efficient restoration. Backups of deleted data are retained for 6 months, at which time they are automatically discarded. Files can be recovered at any time upon request. In case of complete storage failure, it is estimated that recovery time will be no more than 24 hours. Hosting, backup, and recovery costs are paid for by the department.

**Dissemination:** Research results will be disseminated in the usual outlets (including top-rated journals and conference proceedings); in addition, talks and presentations, curriculum materials and design documents will be available as indicated above on the respective university web pages. While copyright laws of some publishers prevent placing copies of the publication on web pages, this will be done on those cases where it is permitted, and pre-prints, to the extent allowed, will all be placed online at the PIs’ online repositories.

**Re-Use, Re-Distribution and Production of Derivatives:** All materials will be available for public use provided that their origin is acknowledged in any publications that use the data. The PIs will retain principal legal rights to the intellectual property developed under this grant, as is compliant with the appropriate policies: Vanderbilt University Policy on Technology and Literary and Artistic Works[1]

**Long-term Data Storage:** Upon project completion, the project results and data, will be stored using our institute (ISIS)’ resources. Research data for this study will be stored on ISIS centrally provided “shared” research storage facility. ISIS has its own local data center and storage facilities for long-term storage of research data. Data from many prior research projects in ISIS are stored in this manner.

[1]<http://vanderbilt.edu/faculty-manual/part-iii-university-principles-and-policies/ch4-policy-on-technology-and-literary-and-artistic-works/>