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Introduction

Diagram Animation and Visualization Environment (DAVE) is a web-based application that acts as a tool for an instructor introducing UML. It will be a UML learner’s first encounter with varying UML diagrams, software architecture and distributed systems. Through visualizing and animating software components and their behavior, it aids the instructor in his teaching and the learner in his understanding.

Business Needs/Requirements

For an instructor to expand the interest in software architecture and distributed systems there is a need to entice new learners. The instructor needs a tool that will evoke both understanding and excitement from within the learners.

In order for the instructor to visualize a diagram of his choice, the application must take information provided by him when rendering the diagrams.

You could say that the current market for diagram visualization and animation is a bit flat, and this is where DAVE steps into the market.

Product / Solution Overview

DAVE will be a web-based application which can visualize UML diagrams, such as class, deployment and sequence diagrams, in 3D. The behavior of the components in the diagram will be animated. The visualization serves the purpose of increasing understanding of software architecture and distributed systems.

The product will be designed for instructors to import JSON files into it, to then have DAVE render diagrams as prescribed in the file.

In later versions, we plan for DAVE to have a feature in which the learners can sign in to a group room through a generated pin code. They will then be able to message each other and have their interaction animated in a sequence diagram. DAVE will also allow for an instructor or learner to edit the JSON file by modifying its visualization.

Major Features

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* JSON file import: DAVE will allow the instructor to import JSON files. The instructor should have the opportunity to import several files at once.
* Diagram visualization environment and controls: The software will visualize the diagrams in a 3D environment, where the instructor is able to control the view to look around the space.
* Diagram animation: The behavior of the components in various diagrams should be animated.
* Animation controls: The instructor will be able to play, stop, pause, fast forward and backward the animation. He will be allowed to control the speed of the animation playing.
* (V2) Group rooms: In later versions, we plan for DAVE to have a feature in which the learners can sign in to a group room through a generated pin code. Using the application they will be able to select other learners, signed in to the same group room, to correspond with. Their interaction will then be animated in a sequence diagram.
* (V2) Diagram editing: In a future version, DAVE will allow diagram creation and modification.

Scope & Limitations

The initial version of Diagram Animation and Visualization Environment will focus on teaching and learning software architecture. This means that the software only will support UML diagrams.

Other Needs

**Reliability**

DAVE will render correct diagrams using data from a JSON file. The system will be designed to have a pass rate of at least 95%. If an outage were to occur, the recovery should take less than 5 minutes.

**Availability**

As a web application the system will be deployed on a web page. Over a time period of a year, this needs to be accessible 99.0% and have the ability to recover from outages.

**Backend**

The animation of the sequence diagram must be a simulation. The system components will be represented by nodes/processes within the system, communicating by sending real messages to each other. The animation will then visualize this the communication in real-time.