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**COSC 4318**

**Assignment 4**

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**ChucK: A Concurrent, On-the-fly, Audio Programming Language**

**Introduction:**

ChucK is a general-purpose programming language, intended for real-time audio synthesis and graphics/multimedia programming. It is multi-paradigm programming language loosely C-like object-Oriented language, with strong static typing. It is developed and designed by Ge Wang as a graduate student working with Perry R. Cook. It introduces a truly concurrent programming model that embeds timing directly in the program flow. It is designed to favor readability and flexibility for the programmer over other considerations such as raw performance. It offers composers and researchers a powerful and flexible programming tool for building and experimenting with complex audio synthesis.

**Release:**

It is widely speculated that the development of the language to have started since 2003 but it is officially released on October 24, 2015.

**Supported Platforms:**

ChucK is distributed freely under the terms of the GNU (General Public License) on Linux, Mac OS X, and Microsoft Windows. On iPhone and iPad, ChucK for iPhone (ChiP) is distributed under a limited, closed source license, and is not currently licensed to public. However, the core team has stated that it would like to explore ways to open ChiP by creating a beneficial environment for everyone.

**Key Features:**

Chuck’s programming model provides programmers direct, precise, and readable control over time, durations, rates, and just about anything else involving time. This makes Chuck a potentially fun and highly flexible tools for describing, designing, and implementing sound synthesis and music making at both low and high levels. It is a powerful and simple concurrent programming model which has a unified timing mechanism for multi-rate event and control processing. The language encourages left-right syntax and semantics within program statements. The classic ’chuck’ runs as a command line program. There are GUI-based integrated development and performance environments as well that can be used as standalone chuck virtual machines, or in conjunction with the command version of ’chuck’ Chuck programs are dynamically compiled to Chuck virtual machine byte code . It provides a unique runtime environment that supports on-the fly-programming which basically means it has an ability to add, remove, and modify code on the fly, while the program is running, without stopping or restarting

**Standard libraries**:

ChucK standard libraries provide Musical instrument digital interface (MIDI) input and output, real-time control through Open Sound Control protocol, and the synthesis Toolkit (SDK) unit generators. SDK is an open source API for real time audio synthesis with an emphasis on classes to facilitate the development of physical modelling synthesizers. It also supports Human interface device and Multi-channel audio.

**Conclusions:**

Hence, the language is intended for audio/ multimedia researchers, developers, composers and performers. It's fun and easy to learn, and offers composers, researchers, and performers a powerful programming tool for building and experimenting with complex audio synthesis/analysis programs, and real-time interactive music. ChucK is supported under many different operating systems. While ChucK code is intended to be truly “platform-independent”, each different OS has their own “features” that make the experience of working with ChucK slightly different.

**Sources:**

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