

# A Distributed Interactive Composition Tool

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## Abstract

As an interactive, computerized, network oriented musical composition tool, *Rabisco* allows users to create stream of MIDI data in real-time by drawing simple sketches using a simple 2-D graphical tablet (pad). Utilizing a client-server architecture, *Rabisco* allows virtual joint compositions where several musicians interact over the network or the internet, each using a *Rabisco* client. Current applications includes Distance Learning, Interactive Music Composition, and Interaction with real world devices such as robots.

**Keywords:** java, remote application, computational music, algorithmic composition.

## 1 Introduction

The new web based musical instrument has been developed using the *Java2* development platform. The first step was to construct a Toolbox to control streams of MIDI data in real time (Costa & Manzolli, 2001). *Rabisco* system is built around a 2-D graphical tablet (pad), where one can “draw” one’s desired *sound*. Currently, Up to four different MIDI voices can be controlled by *Rabisco*. Each of this voices has a set of musical parameters like tempo, rhythm and instrument type. The system design is based on the MIDI protocol and was implemented using the platform and operating system independent Java language. Java is well suited for integration on the Internet as well. The Java standard MIDI synthesizer allows sound generation using the General MIDI Standard with or without a MIDI compatible sound card.

## 2 Musical Implementation

The X and Y axes of the pad area are linearly mapped in the range 0 to 127 integer values, that correspond to the MIDI Table values for Note and Velocity, respectively. The Note Map (X) is set for the chromatic scale but other scales such as *Chromatic, Major, Minor, Donian, Pentatonic, Hexatonic, Blues, Eolian and Mixolidian* are available. We implemented a map filter that keeps the note in “pitch class” relative to the predefined scales and octave modifiers according to the MIDI standard.

## 3 Interaction over a Network

The rich, built in, Java language network features, allow for smooth integration of *Rabisco* with the Internet. *Rabisco* was developed as two versions simultaneously: A client, which is a simple browser based applet, and a full-featured server side, standalone application for music composition.

The *Rabisco* applet version has less features, thus, is smaller for fast web-page loading, and to comply with the applet security limitations. Any Java 1.3 compatible browser can be used: (<http://www.nics.unicamp.br/~marcio/rabisco>).

The fully-featured Java application is a MIDI Server that imports several MIDI streams from clients over a network and exports the mixed audio back to clients. Several *Rabisco* clients, in different remote locations, can cooperate in a virtual musical performance

## 4 Graphic Interface

The Graphical User Interface (GUI) was implemented using Java Swing frames and event listeners not present in AWT.

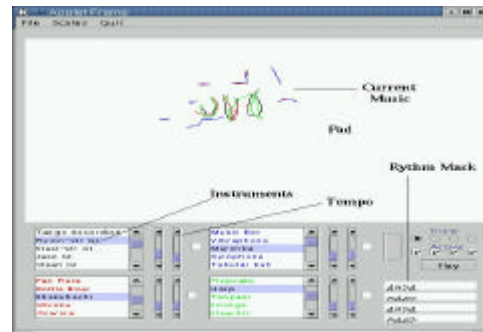


Fig.1 –  
*Rabisco*  
GUI

## 5 Conclusions and Future Work

The applet client is currently used in the Partnership in Global Learning (PGL) project. The idea was to use *Rabisco* as a fun way to enhance sound perception of children by using a ‘sound’ graphical representation. To learn more browse to:

[www.nics.unicamp.br/rabisco/pagina\\_rabisco.html](http://www.nics.unicamp.br/rabisco/pagina_rabisco.html).

The server application is being used in the Roboser and Ada projects. In this case *Rabisco* creates sound patterns to be exported as *Style Files*. See Wassermann et al, 2000 below and: [www.ini.unizh.ch/~expo/2\\_2\\_3\\_0.html](http://www.ini.unizh.ch/~expo/2_2_3_0.html).

Next steps will enhance *Rabisco* GUI to better control tempo, read and write MIDI Files, and to provide local echo while a remote performance using the MIDI server is conducted.

## References

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