Interactive Music Science Collaborative Activities

Team Teaching for STEAM Education

Deliverable 4.9

Final Version of 3D design environment for music instruments

Date:	18/07/2018
Author(s):	Carlos Acosta (LEOPOLY)
Contributor(s):	
Quality Assuror(s):	Petros Stergiopoulos (EA), Renaat Frans (UCLL)
Dissemination level:	PU
Work package	WP4 – Core enabling technologies modules of iMuSciCA
Version:	1.0
Keywords:	3d design, virtual musical instrument
Description:	Final version of the 3D design environment for musical instruments.

Executive Summary

In this deliverable we present the final version of the 3D design environment for musical instruments.

At this stage in the project there will be five virtual instruments: a monochord (or bi-chord if you will), a guitar, a circular membrane, a rectangular membrane and a xylophone. The user can alter virtually some boundary conditions and, by coupling this to a sound engine of Ircam, the user can hear the result of this manipulation. Additionally the instrument with the altered parameters exposed is transferred to the workbench and the other tools for further application like save/load and 3D instrument performance.

The mentioned virtual instruments can be accessed by the following URLs:

https://makers.leopoly.com/create?application=imuscica-V3&instrument=monochord

https://makers.leopoly.com/create?application=imuscica-V3&instrument=bass_guitar

https://makers.leopoly.com/create?application=imuscica-V3&instrument=circle-membrane

https://makers.leopoly.com/create?application=imuscica-V3&instrument=square-membrane

https://makers.leopoly.com/create?application=imuscica-Ve&instrument=xylophone

Version Log			
Date	Version No.	Author	Change
22-06-2018	0.1	Carlos Acosta (LEOPOLY)	Initial content
29-06-2018	1.0	Carlos Acosta (LEOPOLY)	Send to reviewers
18-07-2018	1.0	Carlos Acosta (LEOPOLY)	Adjustments after review
18-07-2018	1.0	Vassilis Katsouros (ATHENA)	Submission to the EU

Disclaimer

This document contains description of the iMuSciCA project findings, work and products. Certain parts of it might be under partner Intellectual Property Right (IPR) rules so, prior to using its content please contact the consortium head for approval.

In case you believe that this document harms in any way IPR held by you as a person or as a representative of an entity, please do notify us immediately.

The authors of this document have taken any available measure in order for its content to be accurate, consistent and lawful. However, neither the project consortium as a whole nor the individual partners that implicitly or explicitly participated in the creation and publication of this document hold any sort of responsibility that might occur as a result of using its content.

This publication has been produced with the assistance of the European Union. The content of this publication is the sole responsibility of iMuSciCA consortium and can in no way be taken to reflect the views of the European Union.

iMuSciCA is an H2020 project funded by the European Union.

TABLE OF CONTENTS

LIST OF ABBREVIATIONS

Abbreviation	Description
ATHENA	ATHENA RESEARCH AND INNOVATION CENTER IN INFORMATION COMMUNICATION & KNOWLEDGE TECHNOLOGIES
UCLL	UC LIMBURG
EA	ELLINOGERMANIKI AGOGI SCHOLI PANAGEA SAVVA AE
IRCAM	INSTITUT DE RECHERCHE ET DE COORDINATION ACOUSTIQUE MUSIQUE
LEOPOLY	3D FOR ALL SZAMITASTECHNIKAI FEJLESZTO KFT
CABRI	Cabrilog SAS
WIRIS	MATHS FOR MORE SL
UNIFRI	UNIVERSITE DE FRIBOURG
VR	VIRTUAL REALITY
AR	AUGMENTED REALITY
CPV	COLOR PER VERTEX

1. Introduction

Updates, adjustments and fixes were mainly originated from all across the project partners:

- Content related updates - like adding new instrument - was originated by pedagogical partners
- UX and UI updates were requested by platform developer and integrator partners
- Communication protocol adjustments were result of cooperation with other technical partners
- And some refactoring and bug fixing issues were addressed by Leopoly internal testers.

2. Installation and technical requirements

Leopoly engine is supported by most recent versions of Edge, Chrome and Firefox browsers. No additional apps or plugins are needed to run the editor. However to use sonification and other platform-related features engine has to be run in the actual workbench as an iframe.

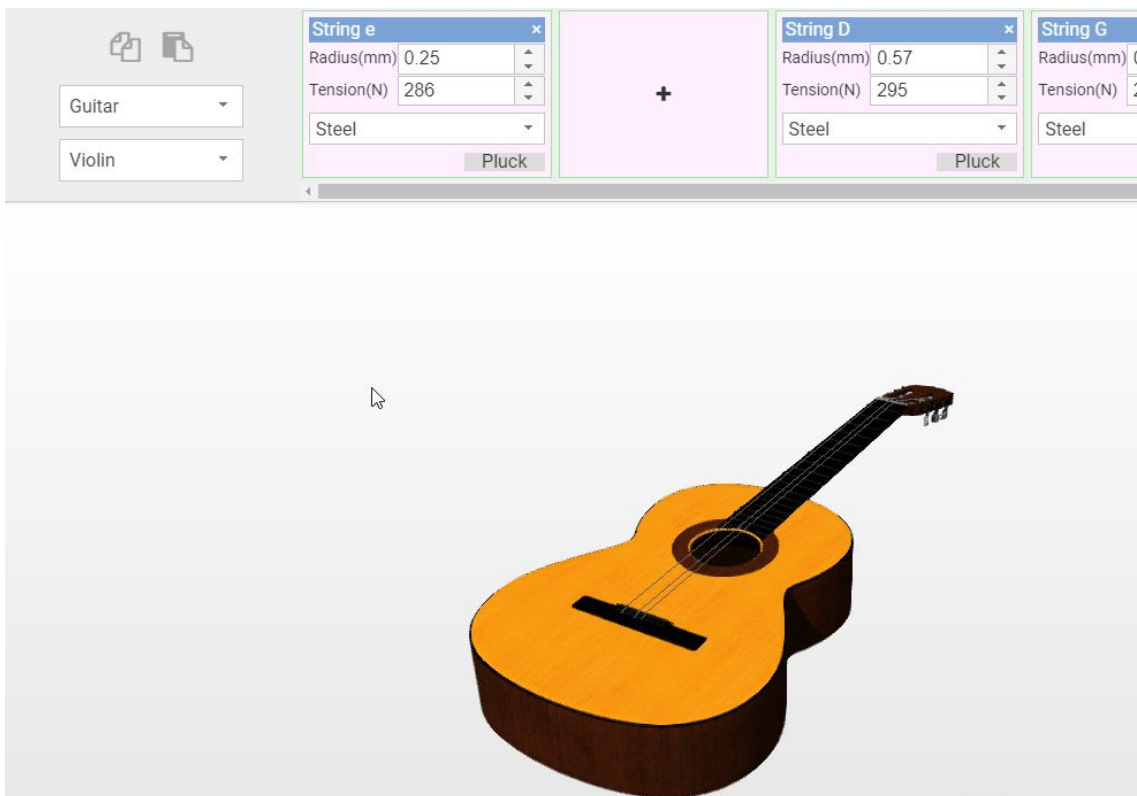**Figure 2-1:** Monochord instrument

Figure 2-2: Guitar instrument

https://makers.leopoly.com/create?application=imuscica-V3&instrument=circle-membrane

Figure 2-3: Circle membrane instrument

https://makers.leopoly.com/create?application=imuscica-V3&instrument=square-membrane

Figure 2-4: Square membrane instrument

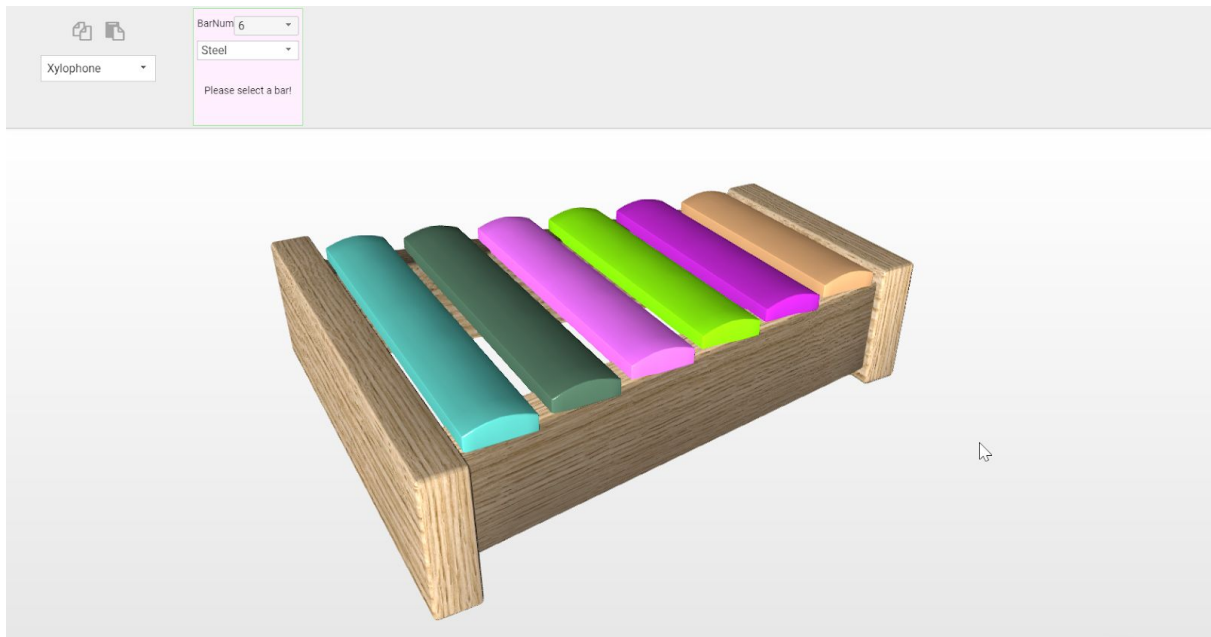https://makers.leopoly.com/create?application=imuscica-V3&instrument=xylophone

Figure 2-5: Xylophone instrument

These virtual instruments monochord, guitar, circular or rectangular membrane and xylophone, will be available for the user on the workbench from the central menu button '3D Virtual Instrument Design'.
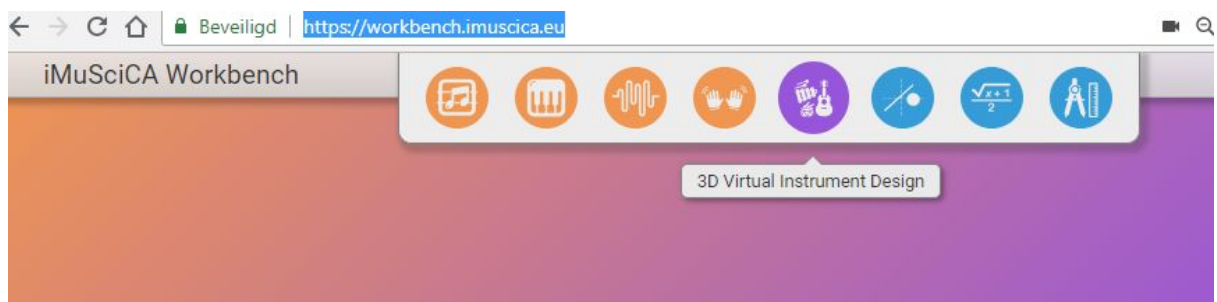

Figure 2-6: Starting '3D Virtual Instrument Design' on the central menu of iMuSciCA's workbench

3. Updates since the intermediate version

Instruments

Guitar instrument has been added to the palette. The instrument technology is very similar to the Monochord: it uses the same protocol for communication to Athena and Modalys while this is also a string instrument.

Xylophone instrument has been updated so there are much more design options for the user to customize it:
- Change frame shape
- Change number of bars
- Change length of each bar

Presets & Materials

String presets for string instruments and **list of Materials** are now available to be loaded from Modalys while the instrument is loading.

Technology

The engine has been prepared to export detailed instrument data for the workbench and other components to store and use them (**Save** to workbench and **Copy** to clipboard). Also the engine is ready to process such data without re-loading the page (**Load** from workbench and **Paste** from clipboard).

UI

For the environment to work better with other tools in the workbench the UI has been updated: all the controls went up to the top of the environment and has been aligned horizontally:
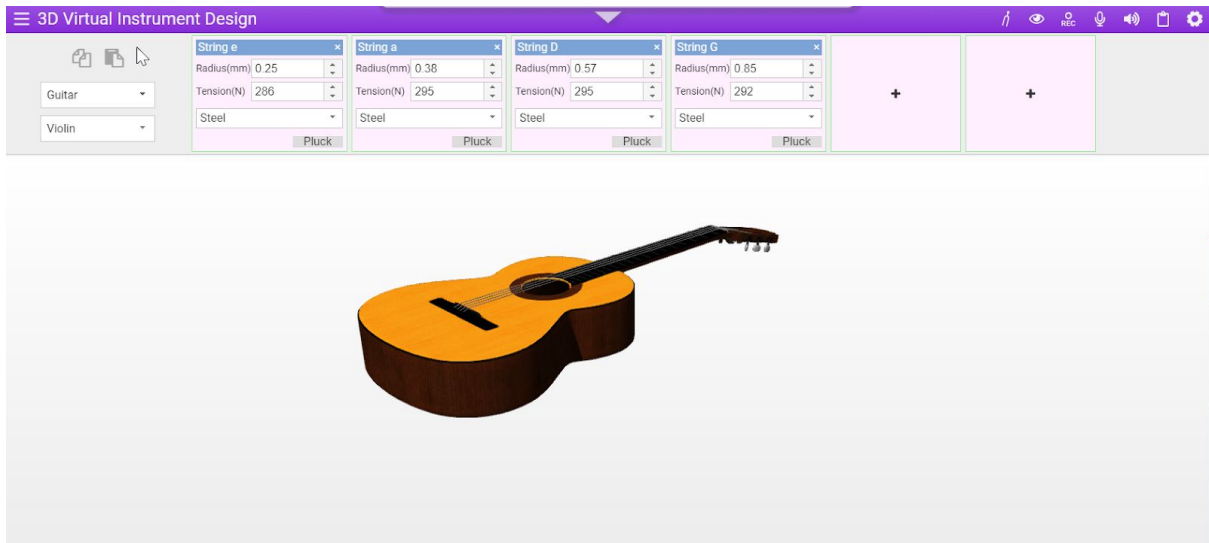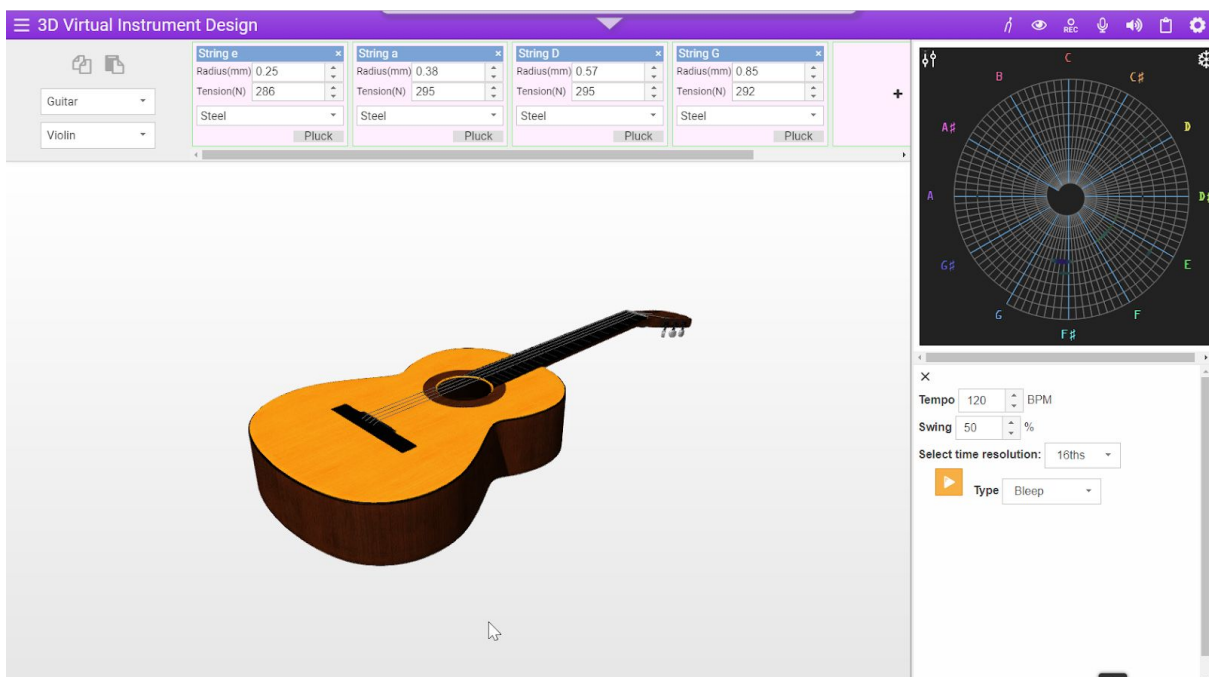

Figure 3-1: New UI without tools

Figure 3-2: New UI with tools open