

# A TABLET APP TO ENRICH THE LIVE AND POST-LIVE EXPERIENCE OF CLASSICAL CONCERTS

**Mark Melenhorst**  
Multimedia Computing Group  
Delft University of Technology  
m.s.melenhorst@tudelft.nl

**Ron van der Sterren**  
VideoDock  
ron@videodock.com

**Andreas Arzt**  
Dept. of Computational Perception  
Johannes Kepler University  
andreas.arzt@jku.at

**Agustin Martorell**  
Music Technology Group  
Universitat Pompeu Fabra  
agustin.martorell@upf.edu

**Cynthia C. S. Liem**  
Multimedia Computing Group  
Delft University of Technology  
c.c.s.liem@tudelft.nl

## ABSTRACT

This demonstration paper describes a tablet application that is developed to make classical concerts more accessible and more enjoyable for a broader audience. The app offers interactive visualizations of a symphony's instrumentation and its score. It also offers timed background information about the piece, the composer, and the historical context.

## Author Keywords

Music visualization; multimedia content analysis; music interfaces.

## ACM Classification Keywords

H.5.1 [Information Interfaces and Presentation (I.7)]: Multimedia Information Systems – *audio input/output, video*; H.5.2 [Information Interfaces and Presentation (I.7)]: User Interfaces – *interaction styles*; H.5.m [Miscellaneous].

## INTRODUCTION

The atmosphere, the complexity of the music, the classical concert etiquette, and even the average age of the audience are examples of reasons why people are hesitant to attend classical concerts, even though they often like the sound of classical music. The EU-funded project PHENICX seeks to overcome this hesitation, making classical concerts more attractive to a broader audience.

For this objective, we redefine the classical concert experience as a multimodal, multi-perspective and multilayer digital artefact [2]. *Multimodal* refers to different musical modalities, including audio and video, but also symbolic scores. *Multi-perspective* has two meanings:

Permission to make digital or hard copies of part or all of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for components of this work owned by others than ACM must be honored. Abstracting with credit is permitted. To copy otherwise, to republish, to post on servers, or to redistribute to lists, requires prior specific permission and/or a fee. Request permissions from permissions@acm.org or Publications Dept., ACM, Inc., fax +1 (212) 869-0481.

*3rd International Workshop on Interactive Content Consumption*, June 3, 2015, Brussels, Belgium

Copyright © 2015 held by Owner/Author. Publication Rights Licensed to ACM

firstly, the user can follow the concert from different physical positions and angles. Secondly, users bring along multiple personal perspectives through their differing levels of musical sophistication, and different motivators (and barriers) to (not) attend classical concerts (e.g. [4]). User-centered design therefore is an important aspect of the PHENICX philosophy. With *multilayer*, we mean that multiple music concert performance descriptors have relevance simultaneously. Descriptors may concern the piece and/or its actual performance.

In PHENICX, the concert experience is considered to include the preparation and anticipation at home, the live experience of the concert, as well as the reliving of the concert afterwards. Therefore, we aim to develop smartphone and tablet apps with functionality for a pre-live, live, or post-live setting. During the first instance of this workshop, we presented initial use cases for such applications, as well as initial user feedback on these ideas [3].

## THE PHENICX APPLICATIONS

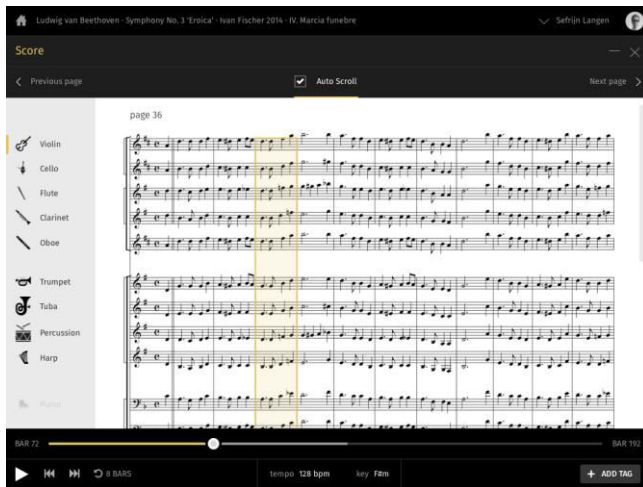
The applications that are currently developed make use of automated and multimodal music description technology, personalization, and music visualization techniques. In this paper we describe a tablet app that concert attendees can use *during* and *after* the concert. The features of the current version are described below.

## SUPPORT DURING THE CONCERT

The start screen of the application shows the available concerts. It lists upcoming live concerts and recordings of earlier concerts. After opening the page for a live concert, the user can choose between two layers with a score follower and timed comments respectively.

## Following the score along with the music

The PHENICX app allows users to follow the score during the concert. The displayed score is aligned with the music. Before the concert, the score is displayed. As the orchestra starts playing, the bar that is played at that moment is highlighted. The highlighted bar moves along with the music across the page. Pages scroll automatically (see Figure 1).



**Figure 1. Following the score along with the music**

For the live score follower, an algorithm was developed based on the method presented in [1]. It ‘listens’ to the live music via two microphones placed above the conductor, tracks the progress of the performers, and at any time makes the current position in the score available to the PHENICX app via Wi-Fi.

### Time-dependent comments

During the concert users can follow a feed of comments on their tablets. The comments are authored by an editor or by other users in the hall. Whereas traditional program notes offer background information without an audible link to the music, the timed editorial comments help users connect relevant information on the concert timeline to audible events. For example, Richard Strauss’s ‘Eine Alpensinfonie’ describes the wonders of hiking through the Alps. During the performance, users could read the following explanation at the time it mattered: “*And then comes the calm before the storm. (...) The wind starts to pick up. We hear descending scalar figures from the introduction. The finale of the symphony begins.*”



**Figure 2 Visualization of instruments playing**

### RELIVING THE CONCERT AFTERWARDS

After the concert, users can go back to the application to listen to the concert recording, and review comments from editors and other users. Additionally, they can continue to explore the piece with the ‘orchestra focus’.

### Orchestra focus

The ‘orchestra focus’ layer displays an orchestra layout with the different instrumental sections. While the recording plays, the instrumental sections that are currently active are highlighted. The brighter the highlighting, the higher the intensity of the particular section (see Figure 2). When the user clicks on an instrument section, the names and pictures of the players are displayed.

‘Orchestra focus’ relies on a note-to-note temporal alignment of the audio recorded during the concert and a multitrack symbolic score of the piece. Audio source separation enables the extraction of the sound intensity for each instrument/section, using the same aligned score.

### FUTURE WORK

The orchestra focus is further developed by integrating source separation technology. Source separation technology combined with the use of face recognition data allows for a new version of the Orchestra Focus, in which the video footage is automatically edited to just show the instrument group the user has chosen.

Another foreseen integration is explaining the musical structure of a piece, based on automatically generated structure visualization data.

At the time of the conference we will be able to present the results of a user test that was carried out during a live concert. We will continue to test future versions of the apps with different user groups.

### REFERENCES

1. Arzt, A., Widmer, G., and Dixon, S. (2008). Automatic Page Turning for Musicians via Real-Time Machine Listening. In *Proceedings of the 18th European Conference on Artificial Intelligence (ECAI 2008)*, Patras, Greece.
2. Gómez, Emilia, et al. "PHENICX: Performances as Highly Enriched and Interactive Concert Experiences." *Proc. of SMC Sound and Music Computing Conference* (Stockholm, 2013). 2013.
3. Liem, C. & Van der Sterren, R., van Tilburg et al. (2013). Innovating the Classical Music Experience in the PHENICX Project: Use Cases and Initial User Feedback. *1st Workshop on Interactive Content Consumption at EuroITV*, Como, Italy.
4. Roose, H., 2008. Many-Voiced or Unisono? An Inquiry into Motives for Attendance and Aesthetic Dispositions of the Audience Attending Classical Concerts. *Acta Sociologica* 51, 3 (September 1, 2008), 237-253.