

TYG: A Multiplayer Instrument-Environment in UE 5

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Abstract— This paper introduces TYG, a single-screen local multiplayer instrument environment developed in Unreal Engine 5. After addressing the historical lack of multiplayer instruments, the authors review DMI and multiplayer video game literature to highlight design challenges and opportunities in the development of new multiplayer instrument. After discussion of design issues, a prototype level is presented. Preliminary findings are shared and some possible future research directions are outlined.

I. INTRODUCTION

Most traditional musical instruments still in use today have evolved over hundreds or thousands of years, but Magnusson notes a general stagnation of designs after the late 18th century [1]. This has fostered a contemporary belief that traditional instruments are somehow optimal or idealized designs, whereas they evolved primarily for acoustical rather than human reasons and are often imbalanced.

Designers have emphasized that the problems brought about by DMIs are significantly and perhaps fundamentally different from those raised by traditional musical instruments, most notably in relation to the player-instrument connection and audience reception. Nevertheless, if there are almost no examples of traditional instruments designed for multiplayer use, the design freedoms of the DMI context have not resulted in flood of new multiplayer designs. Indeed, after memorable work by SensorBand in the 1990s [2], and several multiplayer DMIs presented at NIME between 2001 and 2011 (most based on multi-touch technologies) [3], interest amongst designers appears subsequently to have slowed.

The landscape for multiplayer video games is arguably more optimistic. Multiplayer titles have been part of the history of video games since their earliest days and is widely recognized as a significant contributor to the overall enjoyment and longevity of many popular titles from the early 1970s until today. While local multiplayer has largely been replaced by online multiplayer facilities in the mainstream, there are exceptions, and the former remains a sizeable niche.

II. TYG

TYG is a three-player, local multiplayer DMI named after a three-handled drinking cup. Currently at a functional prototype stage, TYG is built in the Unreal Engine 5 (UE5) game engine. UE5 was chosen for its established capabilities around real-time 3-D environments and local multiplayer

support, as well its more recent integration with the MetaSounds audio programming environment [4].

TYG has two distinct modes. Setup mode is compositional and used outside the timeframe of performance. It enables fundamental musical structures and related parameters to be specified by the nominated (lead) player in a top-down manner. Dropdown menus are provided to streamline the process. Performance mode provides split, shared screen play (SSP) and operates only in real-time. The use of game pads by all players is assumed, but it's possible for one or more players to use a custom controller via emulation. A typical third person control scheme is used by default but is customizable by the player. As a local multiplayer game, communication is expected to be in person and no in-game aids to player communication are provided.

A prototype level acts as a trial environment for collective compositional and improvisational activities. Initially presented a simple double ramp (V shape), the geometry of the level is not fixed and can be altered by the player via the use of floor tiles that bestow specialized abilities.

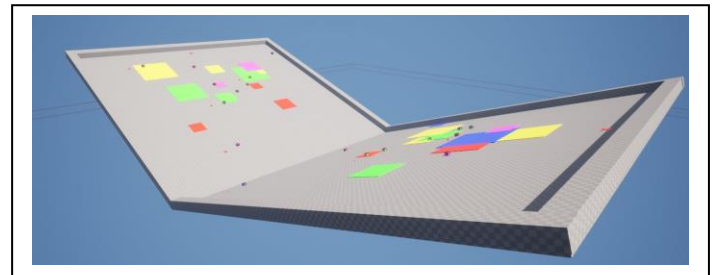


Figure 1. The prototype level. Floor tiles that bestow different abilities can be seen throughout the level.

Initial, informal playtesting has taken place and observations to date will be discussed. Future work in the near-term includes the implementation of loop points as a device for real-time composition, and a formal design study.

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