



## Evaluation of the Master Thesis

### “Large group games with a motion- and orientation-sensing game controller”

by

Ilham Abiyasa Suhardi

Game programming nowadays is a serious and at the same time challenging discipline in Computer Science and Digital Media, requiring knowledge in several computing areas like 3D graphics, wireless networking or interaction design. Since the appearance of Nintendo’s Wii Controller interaction of players has totally changed, leaving traditional keyboards and button oriented game controllers behind. Instead, more natural interaction modes like gesturing, pointing or body motion appear at the scene. Are these new interaction devices more efficient and/or more joyful than the old ones? In the context of his Master Thesis Ilham Abiyasa Suhardi did some empirical research in this field by developing a game prototype for testing different interaction modes with users.

In the introduction, the author describes the problem of interaction in large group games as well as his personal motivation to deal with this subject (chapter 1). There are already some works which report about various interaction methods: using paddles with different colours; audience movement, object shadow or laser pointer tracking; body-attached wireless sensors for music control etc. But from the authors point of view the Wii Remote goes far beyond these interaction modes. He describes the functional and technical capabilities of the Wii device as well as the wide range of commercial applications which already exist, from sports to arts and from gaming to science (chapter 2). Before the author starts designing his own game he first describes the technical abilities but also the limitations of the Wii system in detail: the remote motion sensor (for tilting), the infrared sensor (for pointing) and the game pad (for button-oriented control); the limited Bluetooth connectivity as well as a workaround to overcome the limits (client server architecture); the limitations of the sensor bar and its modification for use by larger groups. In this chapter the author also explains the system architecture of his game concept, i. e. the network of remote controls, client PCs and central game server as well as the game screen as large output device (chapter 3). Now he is ready to describe his own game design and interaction concept using the Wii control in detail: the characters, the items and the game field; the mechanics and visualisation aspects; the different interaction modes (chapter 4). Subsequently, details of the implementation are presented (chapter 5). The author then starts with testing and evaluation of the interaction modes of the game. He describes his five research questions considering the interaction (p. 61), his testing environment, the test persons and the test performance itself. The evaluation results presented by the author are very interesting, showing differences between the input modes with respect to performance and the subject’s preferences of use. Interpretations of the results are provided (chapter 6). A short summary and conclusions for further work close the thesis (chapter 7). The appendix shows some aspects of the implementation and the literature list.

Suhardi’s thesis deals with a very innovative subject of Digital Media and scientifically analyses the potential and impact of a new game device (Wii remote) which rapidly became very successful in the

game market. He had to cope with various technical limitations and creatively developed interesting concepts for solutions, e.g. dealing with the limited number of Wii connections by introducing the concept of intermediate client PCs. Also the game design – clear goals, simple operations – has been properly chosen considering the overall goal of the evaluation and comparability of the interaction modes (at least for the single user test). The author dealt with a very complex task: To test a device, he first had to design and program an appropriate game. He successfully coped with this complexity. The author not only performs a task but also is able to reflect about the conditions and consequences; this ability is also shown in the final part of the thesis dealing with future improvements.

Despite the very positive overall impression of the thesis, some important points are missing which could be subject to the colloquium discussion. To mention some of them:

- Do there already exist usability (user experience) criteria for evaluating games in the literature? Are they applicable to such a new interaction concept like that of the Wii?
- The thesis evaluation part deals with technical performance aspects (connectivity etc.) and user preferences. What about testing criteria like immersiveness, flow, joyfulness etc.?
- Some of the research questions of the author have not been tested/answered, e.g. “How do the teams communicate or coordinate when playing using the group mode?” (p. 61) Mentioning some observations of “shouting” is not a satisfactory research result. What means cooperation in the given game, do there exist built-in cooperation facilities?
- Some questions/remarks are related to the testing strategy:
  - How does the sample (mostly well trained/hard-core gamers?) influence the results considering the different modes?
  - What about a “training effect” considering the same order of test performance (single, group of 2, group of 3)?
  - To avoid testing artefacts, it would have been better to first improve the system performance (connection and pairing problems, discontinuous mouse movements etc.) before evaluating it.
  - Is the given game task a good example for testing team cooperation or is it more valid for single user performance tests, i.e. what would have been the “cooperative advantage”?
- In traditional HCI the “direct manipulation” interaction mode (WIMP interfaces) is seen as being the most preferred mode of “normal users”, compared e.g. with “command line” interaction. Which degree of directness could be associated with the three Wii modes and what are the reasons that the most direct mode is not the most preferred one?
- The title of the thesis addresses “large groups” (80-100 players). The actual evaluation dealt with small groups (6 players) for practical reasons. To which amount are the results transferable to large groups?

But despite of these critical comments and questions I have to state that the master thesis of Mr. Suhardi is a good work dealing with challenging questions in the field of computer game evaluation. From a formal point of view the work is very good, considering readability, illustrations, layout etc.

Summing up, in comparing strengths and weaknesses of the work, I evaluate the Master Thesis of Ilham Abiyasa Suhardi, with the preliminary mark

**1,7 – good.**

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Prof. Jürgen Friedrich