Big Robot Mk.1A

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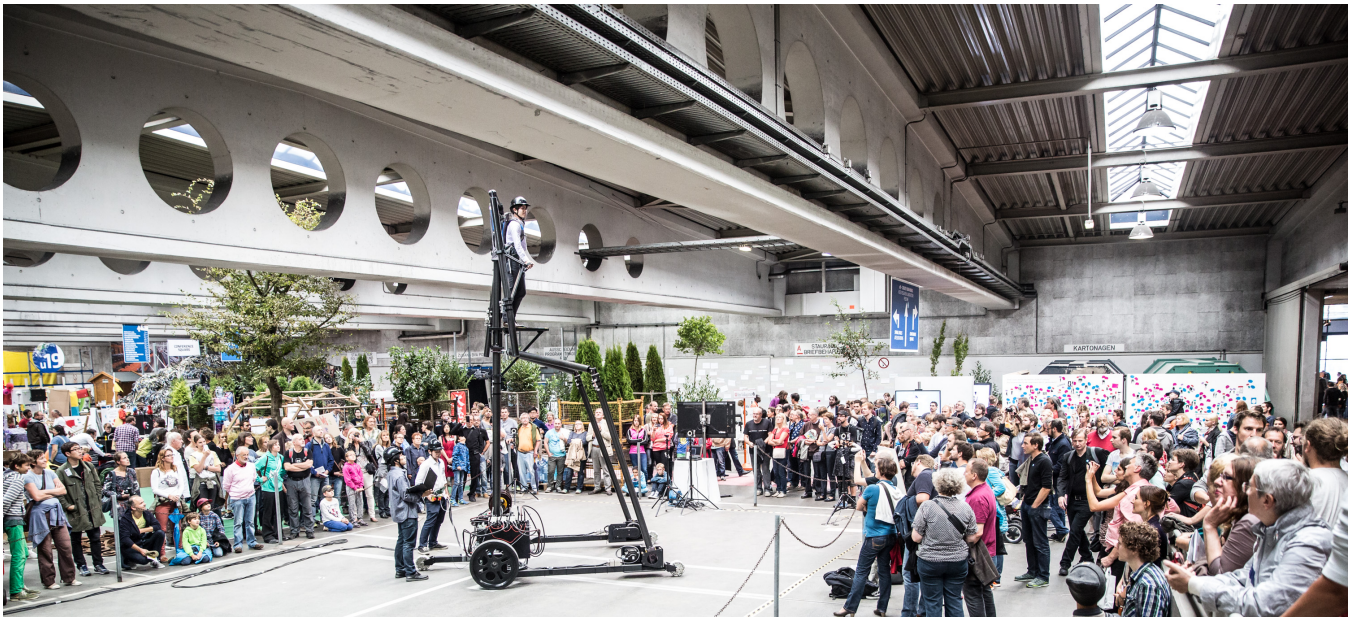

Figure 1: *Exhibition of BigRobot Mk.1 at Ars Electronica 2015.*

Abstract

The Big Robot Mk.1A has two legs with wheels, mounting the pilot at 5m height position. The robot goes forward according with the motion of the feet of the pilot. It is programed to make trajectory of head position of 5m humanoid. Thus, the pilot feels as if his/her body were extended to 5m giant.

Keywords: locomotion, mobile robot

Concepts: • **Human –centered computing ~ Human Computer Interaction;** *interaction devices;*

1 Introduction

Large-scale humanoid robots, such as Gundam or Macros, are popular in Japanese animation and Manga. What if such robots appear in the real world? Those robots are used in battle fields in fictional stories. However, large-scale humanoid robots in the real world are highly vulnerable and fragile so that they cannot be used in battle fields. On the other hand, existence of real large-scale robots may inspire courage to audience. Thus, it has potential as an art form.

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2 Design and Implementation

The Big Robot Project in the PhD. Program in Empowerment Informatics, University of Tsukuba, aims to develop world-largest robot in which pilot can ride and move. The Big Robot Mk1 has two legs with wheels, mounting the pilot at 5m height position. The robot goes forward according with the motion of the feet of the pilot. It is programed to make trajectory of head position of 5m humanoid. Thus, the pilot feels as if his/her body were extended to 5m giant. The biggest technical issue in large-scale robot is falling down to the ground. Thus, the base frame of BigRobot Mk1 is made of steel and its linkages are made of CFRP. This structure enables low center of gravity and prevents from falling down.

Big Robot Mk1 was exhibited at Post City of Ars Electronica Festival in 2015 (Fig.1). It looks like having only bones but position of joints are captured by using Optitrack sensors and virtual costumes are superimposed (Fig 2). It is placed at the entrance of the venue and proved that it attracts passing people. Although it is under development and motion is very limited, riders and audience are empowered.

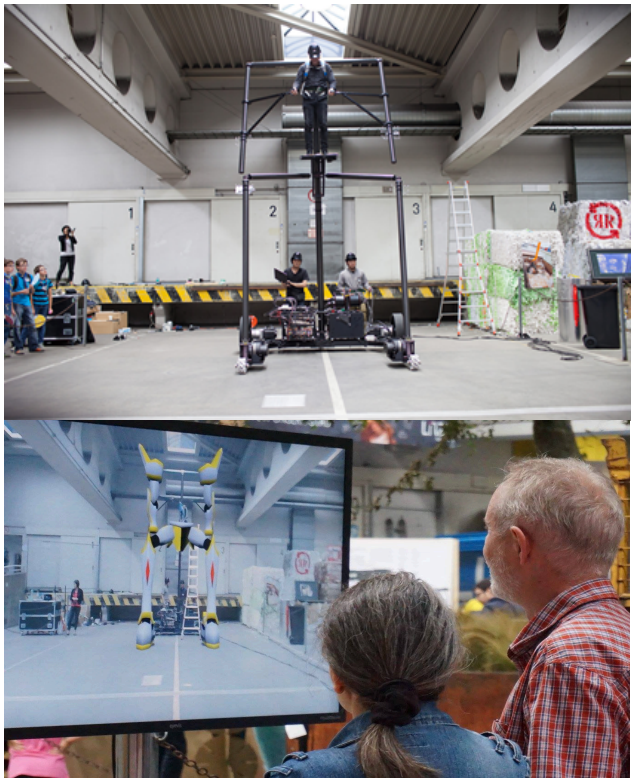

Figure 2: *Real structure and virtual costume of BigRobot Mk.1*

3 Conclusion

During the exhibition in Ars Electronica, we had much difficulty in disassembling and shipping. We therefor designed a folding mechanism that fit to a marine container, in order to exhibit it at SIGGRPH (Fig.3). It is named Big Robot Mk.1A. It aws demonstrated in Open Studio of the Empowerment Studio at the University of Tsukuba (Fig.4). The exhibition was open to public and partisipants could walk outside of the building. The exhibition proved that novice rider can walk on the Big Robot Mk.1A.

Figure 4: *Open Studio Exhibition of BigRobot Mk.1A*

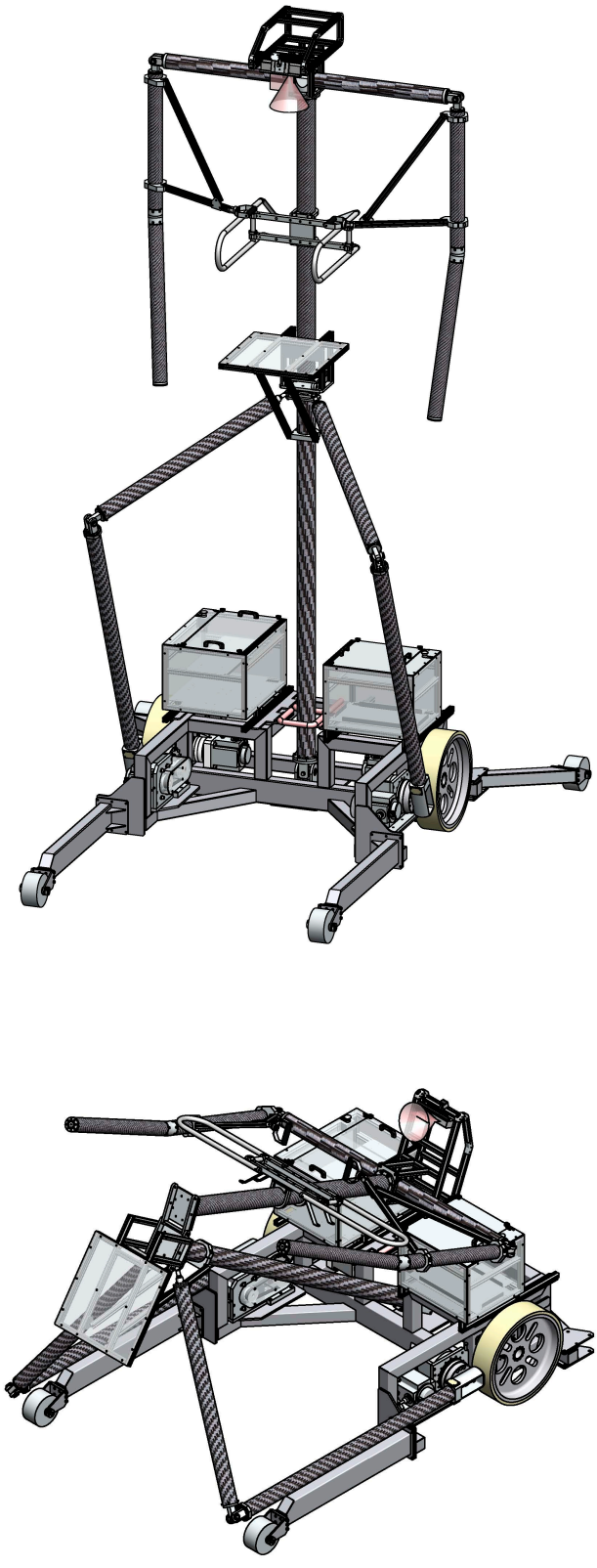

Figure 3: *Folding Mechanism of BigRobot Mk.1A*