

FEATURE EXTRACTION AND VISUALIZATION FROM 3D POLYGON DATA FOR DETERMINING A MORE COMFORTABLE GRIP FORM – AWARENESS OF “COMFORTABILITY” –

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ABSTRACT. *Gripping is a very important function in daily life and there will be the best gripping form for each person. If the form is the best, then it will contain some information about the physical and mental condition of the person, and there might be some common mathematical formulas by which we can describe the best form to each person. Such concept as to best fit everybody may be the concept of Universal Design, however, no theoretical research has yet been done. Takahashi and his colleagues have developed a cup called “Waga-Hai” for people who cannot use a standard one easily. We believe that the key information for deriving formulas for universal design will be included or imbedded in this 3D polygon data. As deriving such a formula for universal design is a big challenge for us, we first start to extract features which would be used in the formula. The objective of this paper is to determine the features reflecting the distribution of grip force of each finger and the location of them.*

Keywords: Waga-Hai, Feature visualization, Comfortability of gripping, 3D polygon data, Awareness

1. **Introduction.** Gripping is one of the most important human functions in daily life and there will be the best gripping form for each person. If the form is best, then it will contain some information about the physical and mental condition of a person, and there might be some common mathematical formulas by which we can describe the best form. This we call a “Universal Design”. There have been no analytical studies about Universal Design up to this point. Thus, research about Universal Design provides a big challenge for us to develop a common way of designing tools (e.g., cups) best suited to a handicapped person. For this objective, Takahashi and his colleagues have developed a cup for people who cannot use a standard one easily [1, 2]. They had a person grip a clay mold to show the best form, which was then converted to 3D polygon data. From the 3D polygon data a cup called “Waga-Hai” was created. Authors believe that the