

The Uncanny Valley is a theoretical representation of human acceptance in regards to androids and other human analogues. It states that as an android becomes more human, it gradually gains more acceptance from humans, until it reaches a point at which it appears human but does not have the corresponding motor skills associated with being human, and it appears “inhuman” to viewers. Many researchers believe that this is the result of a base instinct for pathogen and disease avoidance developed over millions of years of exposure to dangerous environs. Others believe that it triggers a base feeling of death and replacement or insignificance, and that it is somehow linked to Capgras syndrome, where the affected person believes that people close to them have been replaced by androids or other non-human replicas.

## Introduction

The goal of the Uncanny Valley project is to discover new ways of measuring the physiological responses that humans experience when viewing androids, and use this information to someday overcome the limitations of the Uncanny Valley. These reactions were originally recorded only by having the viewer answer a set of questions about the stimuli they were exposed to, while the Uncanny Valley project at the SDSC aims to find other ways of measuring the subconscious response to viewing said images. Studies have already been done using fMRI scans in order to record brain activity, and the research being conducted at the SDSC aims to find more cost effective and simpler ways of achieving the same results.

## Methods:

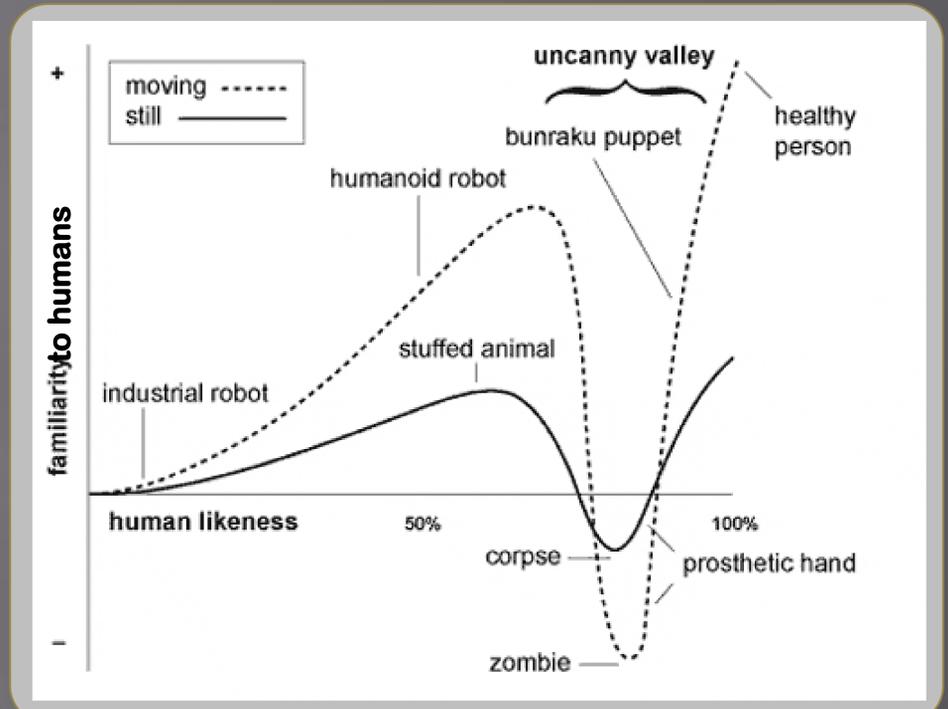
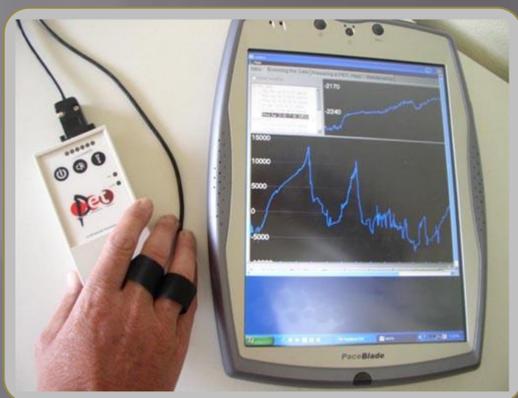
### Autodesk Maya

During the course of the internship program Autodesk Maya 8.5 was used to create 3D representations of humans, animate them and then alter them to make them appear uncanny. Autodesk Maya is a professional 3D creation and animation software used in many 3D creation studios like Pixar and Insomniac Games. The program allows the creation of surfaces and curves, as well as deformation and sculpting of those surfaces. Once the object has been created, it allows for the animation of said object using a Key frame and Joint-based system.



### Cost Research

Maya wasn't the only aspect of the internship however, research on the prices of various physiological measurement systems was also conducted. These Physiological monitors included, but were not limited to Galvanic Skin Response Monitors and Heart Rate Monitors. GSR is the subconscious reaction that your body exhibits when aroused in any way shape or form, and as such it is a good tool for monitoring the body's reaction to stimuli, however it can be inaccurate and/or be set off by an unrelated event and therefore give false positives. Another way to measure general arousal would be to use HRM's. Heart Rate monitors do exactly as their name suggests, and monitor the heart rate of a test subject when exposed to stimuli.



This is a visual representation of the “Uncanny Valley”. It shows a theoretical comparison human likeness and familiarity that also reflects movement.



Both the scientific community and the film industry are looking for ways to overcome the “Uncanny Valley” (Source: IReyes Blog)



Many Humanoid robots fall into the uncanny valley simply because they don't look or act “human enough” (Source: Gynomite)



One of the very first “Uncanny” instances in the film industry was Pixar's short “Tin Toy” which had a negative reception due to the babies' inhuman movements and appearance. (Source: Pixar)

## Acknowledgements

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