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Project ICARUS

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1 State of Art

A typical mechatronic device encompasses many fields of technological engineering. This includes mechanical engineering, electronics, computer engineering, systems and control engineering.

To thoroughly design such a system with awareness of all its elements during each step of the process requires the foresight and knowledge of all the components and relations between individual elements. This is the purpose of the state of art - a prerequisite to the initialization of a project. By the end of this section we will have explored existing technologies and solutions to our problem and drawn up a basic model of the mechatronic device.

1.1 The Problem

Certain situations that endanger human life benefit from the intervention of a robotic device. However, these robots may be limited in functionality compared to the human counterpart. In cases such as bomb disposal, nuclear power station decommissioning or handling of dangerous substances the dexterity of a human hand is significantly important.

1.2 The Solution

The mechanical hand is a device that has been iterated on many times in recent history. Control of such a hand is either by machine or human. For automated tasks, a machine controlled hand is more than sufficient. However, in unpredictable environments human intervention is still necessary.

This is where the idea stems together. A mechanical hand with the full dexterity of its real counterpart controlled in an intuitive way by a human. The control will be based on the idea of mimicking the operators limbs. Pairing this with a strategically placed camera and a virtual reality headset, we have an operator who is fully immersed and in full control of the situation at hand.