

# Hand pose replication using a robotic arm

**ROBOTICS** is the future. Simple but true. Even today, they support us, make the products we need and help humans to get around. Without robots we would be worse off. Kirsty Aquilina (supervised by Dr Kenneth Scerri) developed a system where a robotic arm could be controlled just by using one's hand.

The setup was fed images through a single camera. The camera was pointed towards a person's hand that held a green square marker. The computer was programmed to detect the corners of the marker. These corners give enough information to figure out the hand's posture in 3D. By using a Kalman Filter, hand movements are tracked and converted into the angles required by the robotic arm.

The robotic arm looks very different from a human one and has limited movement since it has only five degrees of freedom. Within these limitations, the robotic arm can replicate a person's hand pose. The arm replicates a person's movement immediately so that a person can easily make the robot move around quickly.

Controlling robots from afar is essential when there is no prior knowledge of the environment. It allows humans to work safely in hazardous environments like bomb disposal, or when saving lives performing remote microsurgery. In the future, it could assist disabled people.

A video of the working project can be found at: <http://bit.ly/KkrF39>. ●

*This research was performed as part of a Bachelor of Engineering (Honours) at the Faculty of Engineering.*



## Islands and Security

**ISLANDS** have played different and unique roles throughout history. The process of decolonisation, starting in the late 50s, led to a proliferation of small island states. These new independent nations sought to develop their own foreign and security policies.

André P. DeBattista (supervised by Dr Isabelle Calleja Ragonesi) studied International Relations in Malta's history to examine the role of small island states in regional and global security. He found that small island states reinforce security and can stabilise regions.

Due to their geography, small islands can wield disproportionate influence. They may serve as military outposts and control waterways used for commerce, trade and defence. However, islands can still be vulnerable, weak and externally manipulated.

For millennia, Malta has been fought over by regional powers for purposes of trade and defence. In 1964, for the

first time in its history, Malta became independent and could chart its own political trajectory. Despite political independence, it was and still is reliant on other states.

Throughout its history, Malta has played an important role in the provision of regional security. It had a strong influence in both the Cold War period and also after its recent accession to the EU.

DeBattista believes that Malta is well positioned to spearhead research on small islands; "as a small island state, Malta managed to adapt to different circumstances and challenges. It excelled both within its region and in the international community. This success should encourage us to conduct further research in this niche area, in order to provide solutions and policy options to other small island states." ●

*This research was undertaken as part of a Masters of Arts in International Relations.*