# VERBOTICS HELPS TO ACCELERATE RESEARCH AND TRAINING FOR THE FACILITY FOR INTELLIGENT FABRICATION.

**LOCATION:** Wollongong, NSW

**YEAR:** 2020

**APPLIC:** Research and Training

**SOLUTION:** Verbotics Weld

## THE CLIENT

The Facility for Intelligent Fabrication (FIF) is a centre for advanced manufacturing research and technology based at the University of Wollongong in Australia. They develop processes, technologies, and advanced manufacturing techniques for the next generation of materials.
The FIF has a strong expertise in welding applications, digital twins, industry 4.0, and wire-arc-additive-manufacturing (WAAM).

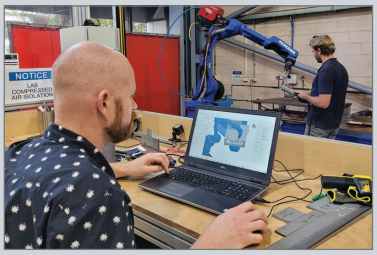
The FIF also provide a supporting role for the Australian Manufacturing Industry where they are able to provide advice and demonstrate the latest fabrication technologies.

## THE REQUIREMENT

For students and researchers without robotics expertise, programming the robots relied on assistance from key personnel taking up considerable time and effort. This led to smaller and simpler tests being conducted compared to what is achieved today. The FIF also have robots from three different makes. A program from one robot cannot run on a different one without significant modification, and expertise on one robot make was not easily transferable to another.

A second problem for the FIF is planning motion paths for their WAAM research. In this case the burden of programming limited the complexity of the parts they were making, or utilise less optimal process paths due to the difficulty in creating complex coordinated motions.

## THE SOLUTION



*Research Engineer Evan Brown using the Verbotics Weld software*

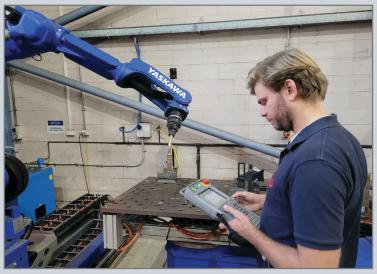
Verbotics provided the FIF with two programming capabilities to address their problem.

The first is Verbotics Weld, a desktop application that generates robot programs from design drawings.

This allowed users with very little robotics expertise to generate robot welding programs. The second is a planning service which they integrated into their WAAM software solution enabling high complexity in process path planning capabilities.

## THE RESULTS

The FIF use the Verbotics Weld software with their Yaskawa MA1410, ABB IRB 2600ID and Universal Robots UR10e workcells. Using Verbotics has allowed FIF to cut down on programming time, turn experiments around quickly, and have a consistent and efficient workflow across all their robot systems. Verbotics' ease of use also allowed FIF to train research students (without any robot expertise) to undertake research in less time. It has given staff the confidence to allow students to explore without the need for constant supervision. As an additional benefit, students with CAD experience could transfer their work directly to robots which has given them much needed real-life experience.



*Dr. Joseph Polden running with a Yaskawa MA1440 welding cell*

**"Honestly, we do it all in Verbotics now. It's so easy to learn!"** - Evan Brown

**"Since Verbotics, we stopped trying to teach how to use teach pendant programming. We didn't need to anymore - Verbotics is our new de-facto method."**
**- Dr. Joseph Polden - Research Fellow**

Verbotics Weld's flexibility was also highlighted a key feature for the FIF. It allowed them to integrate with wire-arc-additive-manufacturing (WAAM) software for research and customise unusual use cases. They found it easy to automatically orient positioners, control torch angles and avoid collisions with no additional effort. Dr Phil Commins – Acting Director of the Facility for Intelligent Fabrication was quoted saying:

**"It wouldn't be economic for us to do it any other way, Verbotics allows us to get so much more done."**

Verbotics has also partnered with the FIF to develop support for Universal Robots URScript and URP programming languages. Universal Robots are the market leader in collaborative robots (cobots), which allow closer human-robot interaction than traditional industrial robots.

Industry partners and visitors of the FIF have also been impressed with how simple Verbotics Weld is to use with several now utilising the application for their robot programming appilcations after initial demonstration at the FIF.

## FUTURE APPLICATIONS

Verbotics have become an essential tool for the FIF's research and development, and they appreciated the software's simplicity, ease of use, and support. With feedback and support from the FIF Verbotics are working on planning algorithm improvements to continue to meet the FIFs requirements.

When asked his thoughts on Verbotics, Dr Phil Commins said:

**"We are very pleased with what we were able to achieve with Verbotics. It's targeted, easy and streamlined. It's just for robotic welding and it solves our problems really well."**