

Editorial Board

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Recent Publications

1. Al Hussin and AB
Abdullah, Welding
International, 38(1),
45-56, 2024.
2. MFA Md-Azlin et al.,
ARAM, 113(1), 189-
206, 2024.

Active Grants

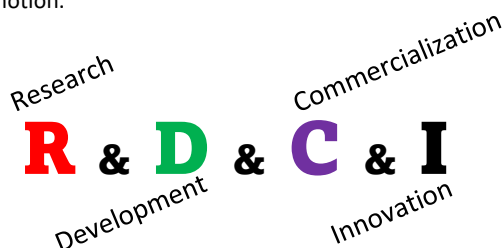
FRGS Grant

Title: Investigation on
the effect of hot forging
on the deformation
behavior and
microstructural response
of Wire Arc Additive
Manufacturing (WAAM)
of high strength low
alloy (HSLA) steel
components, 2022-2025



Preface

Typical academicians play around research only, and very few of them move further for development and much lesser to commercialization. Research and publication are their daily activities, from fundamental to exploratory research, and they repeat that over the years. One of the main reasons is because its offer better in terms of KPIs than others and give advantages to the researcher when promotion.



Involving in commercialization requires a lot of effort and commitment. Researcher has no option unless must go out of their comfort zone. Commercialization and innovation are two distinct fields or discipline. Compared to commercialization, innovation is significantly simpler. Patent filings and technology licensing (TL) are typically the ends of an innovation. Therefore, for the purpose of less headache, researchers prefer TL, even though they would receive a reduced percentage from sales. In other case, to commercialize, a spin-off or start-up firm must be established, and they may serve as the CEO. This demands complete dedication and may result in less time and attention being spent on teaching and learning activities. It appears that lecturers are now required to participate in commercialization is one of the primary criteria used to define the KPIs.

Custom-made 3D Welding Machine

The 3D welding machine enter a new phase, so that it can be utilized by others. Initially, the machine is produced to prepare 3D profile for our research. Our constraint is the price of the machine in the market is too expensive. After in service for after 3 years, it's benefited a lot to us. Many students utilized the machine during their project. In 2023, the machine was recognised in various exhibitions. Two golds and one special award were grabbed, which at least proved the potential of the technology to bring it up to the next level, commercialization. Moving further, 2024 may be the right time the innovation begins to penetrate the market. However, our challenge is marketing. On our own and find collaborators?

MFRL Research Seminar 2023



Metal Forming Research Laboratory
(www.metalforming.eng.usm.my)

PRESENT TO YOU

THE MFRL
RESEARCH
Seminar

HYBRID MODE

INVITED SPEAKER
TS. DR. AZMAN
ISMAIL

INVITED SPEAKER
PROF. R.
RAJENDRAN

APRIL 25TH, 2024

new discoveries in lightweighting
manufacturing strategies

Main objective if the seminar is to share the
outcomes from the student (postgraduate and
undergraduates) projects related to the lab

ALL ARE INVITED

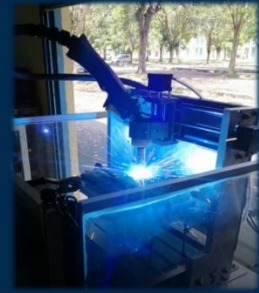
This is the 2nd time MFRL organized an event for the members to share their findings. This time, two prominent talks from our collaborators.

Contact Details

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INNOVATIVE LOW-COST 3D WELDING MACHINE FOR PRECISION PART REPAIR AND ENHANCEMENT (3D-WELD USM-1)

by
METAL FORMING RESEARCH LAB,
School of Mechanical Engineering USM



- Develop a low-cost Wire Arc Additive Manufacturing (WAAM) machine to democratize access to advanced metal 3D printing technologies.
- Traditional metal 3D printing technologies are expensive. The project aims to address this gap by introducing an affordable WAAM machine, enabling a wider range of users to benefit from metal additive manufacturing especially for part repairing.

NEEDS

- Cost-Effective Solution
- Modularity
- Compact size and mobile
- Multi-Material
- User-Friendly Interface
- Safety Features
- Easy Maintenance

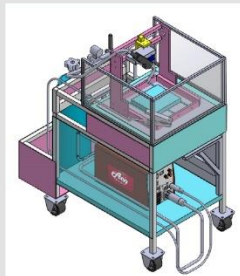


Figure 1: 3D-WELD USM-1

APPROACH

- Designed with modularity and affordability as its pillars embark on the remarkable task of rejuvenating the compromised repair part.
- The modular approach mentioned for this machine is the three reconfigurable systems installed; modified CNC machine, MIG welding machine, and the programming software (GRBL)

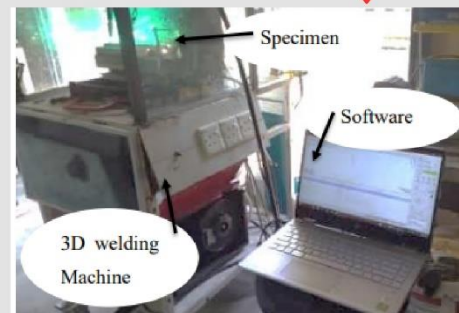
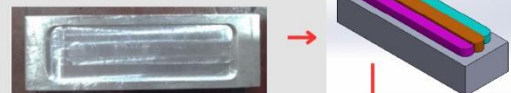


Figure 2: Specimen preparation steps for tribology test

BENEFITS

- Extend the lifespan of products by repairing the part
- Lowering Entry Barriers for SMEs
- Cost Reduction in Critical Industries
- Alignment with Sustainability Goals
- Incentivizing Ongoing Research and Development

COMPETITORS

Current Market Leaders:

Established companies dominating the metal 3D printing market

This technology has the **potential** to shape the future of **education and manufacturing**. Below are the key points on why we are innovating this DIY metal-based AM machine.

Accessibility Curriculum Enhancement Interdisciplinary Learning Real-World Applications

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