# BISMA MUTIARGO

Bisma Mutiargo is an engineer with expertise in data-driven processes for metrology and NDT sentencing. He has proficiency in deep learning development, especially in image and pointcloud processing. He has spearheaded development projects for industry leaders such as Rolls Royce, Hyundai, Shell, and IHI, as well as public agencies and universities. These projects focus on automatic image and pointcloud analysis for measurement and non-destructive evaluations. Bisma has also been actively engaged within the scientific community to share new technology and research through publications in reputable journals and speaking in scientific conferences.

## PERSONAL

**Name**
Bisma Mutiargo

**Address**
114 Bedok Reservoir Road #06-154
470114 Singapore

**Phone number**
90880212

**Email**
bisma.mutiargo@gmail.com

**Gender**
Male

**Nationality**
Indonesian (SPR)

**Marital status**
Married

**Website**
https://bismamutiargo.com/

**LinkedIn**
www.linkedin.com/in/bisma-mutiargo-5727b4a3

## INTERESTS

- Football
- Scuba diving (NAUI Master Diver)
- Tinkering with Arduino

## LANGUAGES

| | |
|---|---|
| English | ★ ★ ★ ★ ★ |
| Indonesian | ★ ★ ★ ★ ★ |

## WORK EXPERIENCE

**Jun 2013 - Jul 2015** — **Assistant Applications Engineer**
Cairnhill Metrology, Singapore

**Jul 2015 - Jul 2017** — **Assistant Development Engineer**
Advanced Remanufacturing & Technology Centre, A*STAR, Singapore

**Jul 2017 - Jul 2019** — **Senior Assistant Development Engineer**
Advanced Remanufacturing & Technology Centre, A*STAR, Singapore

**Jul 2019 - Jul 2021** — **Development Engineer**
Advanced Remanufacturing & Technology Centre, A*STAR, Singapore

**Jul 2021 - Present** — **Senior Development Engineer**
Advanced Remanufacturing & Technology Centre, A*STAR, Singapore

In the last 7 years my active role has been to spearhead development projects for the manufacturing industry for industry leaders such as Rolls Royce, Hyundai , Shell and IHI, or public agencies such as Housing Development Board, or universities. These projects focuses on the area of automatic image and pointcloud analysis for measurement and non-destructive evaluations, by the means of traditional algorithmic development, or data driven approach (DL/ML), to improve productivity, or to implement a fully autonomous robotic decision making and spatial positioning.
I am also been actively engaged within the scientific community to share new technology and research through publications in reputable journals and speaking in scientific conferences.

## EDUCATION AND QUALIFICATIONS

**May 2010 - May 2013** — **Diploma in Mechatronics Engineering with Minor in Business Management**
Nanyang Polytechnic, Singapore

**Aug 2015 - May 2019** — **Bachelor (B.Eng) in Mechanical Engineering (Hons) with Specialisation in Innovative Design**
Nanyang Technological University, Singapore

**Jan 2023 - Jan 2025** — **Masters of Science (By Research)**
University of Huddersfield, United Kingdom

Topic: Fast Surface Determination of XCT data Using Machine Learning
Institute: EPSRC Future Metrology Hub
Supervisor: Dame Prof. Jane X. Jiang, Prof. Paul Scott, Dr. Shan Lou, Dr. Wenhan Zeng, Dr Andrew A. Malcolm.

## SKILLS

| Skill | Rating |
|---|---|
| Python | ★ ★ ★ ★ ★ |
| Keras/Tensorflow/PyTorch | ★ ★ ★ ★ ★ |
| C++ | ★ ★ ★ ★ ☆ |
| Image Processing | ★ ★ ★ ★ ★ |
| CAD Reverse Engineering + 3D Scanning | ★ ★ ★ ★ ★ |
| Project Management & Leadership | ★ ★ ★ ★ ★ |
| Metrology | ★ ★ ★ ★ ★ |

## NOTABLE PROJECTS

1. **_AR- assisted automated 3D scanning cell (Co- Technical Lead)_**- Developed HoloLens-to-robot syncronisation scripts to build a self-programming 3D scanning robot cell with the help of a spatial scanner in a HoloLens device. This was created in-house to remove operator dependencies and was found to increase productivity by 3000%. This was deemed as an ARTC Success Story in its Year Book 2018. **TD-ARTC-2017-PV-007**

2. **_Augmented Reality Surgical trainer for surgeons_**- Performed live scans of a surgery patient in an operating theatre in KKH in order to build 3D models of human bodies to assist in the creation of an AR-assisted training program for surgeons.

3. **_Automated Toolpath Generation with vision system (Technology Lead)_**- Developed 3D-scanner to robot synchronization algorithm for a codeless robot programming platform to eliminate the need for a skilled programmer to create a new toolpath for a robot. This solution was implemented in a number of local SMEs (e.g. ACP and Abrasive Engineering), and it was also featured in A*CCELERATE NOW! event as part of the Guest of Honour station which was graced by Minister Masagos Zulkifli. This solution was also showcased at the Singapore Airshow 2020. The code to this solution is now licensed to a local startup, Augmentus Pte. Ltd.

4. **_Creation of Augmented Reality Tour_**- As part of A*STAR Annual Makeathon 2019, we created an augmented reality tour with Microsoft HoloLens that serves as a digital tour guide for visitors to ARTC's open model factory exhibit to reduce the need for manpower. This creation was the winner of the makethon.

5. **_Development of defect detection capabilities in internal 3D printed components (Technical Lead)_** Secured a grant of $260,000 to develop defect quantification capabilities e.g cracks, porosities, broken lattices, and trapped powder in 3D printed metal components using deep learning (UNET, MaskRCNN & SSD). The method was shared at the IMFIA2019, IWAIT2019, and SINCE2019 international conferences and was further published in SPIE journal & NDT.net. We have also since collaborated with NUS to build and maintain an open-source database for X-ray CT images containing 3D printed component defects.

6. **_A part of Singapore's project Stronghold (COVID19 Project)_**- Reverse engineered, and remanufactured thousands of viral transport media (VTM) tubes in a short timeframe to meet the urgent need for mass PCR testing during the early phase of the pandemic.

7. **_Creation of a robotised marking system for Greyform (HDB)_ -** Developed a self-positioning algorithm with LiDAR sensor to enable robots to recognise its location in a room. This solution enables adaptive toolpath planning and has since been implemented by Greyform for automated marking in BTO prefab flats- **TD/IP No: 08052020_ARTC_QUEK**

8. **_Creation of synthetic image generator for AI training (Technical Lead)_**- Created a digital platform for a Korean automotive manufacturer to generate simulated defect images which are used to build a quality control AI model within its assembly line - **TD/IP No: PTD-IPV-21-001**

9. **_XCTPore- An Open Source Database for Porosity in X- ray CT scanned components_**- Developed, maintained, and launched an open source image database containing XCT scanned images of porosity in AM scanned components. this database is free for use for individuals and enterprise, and is published under the BSD-2 Creative common license.

## PUBLICATIONS

- **Defect detection using trainable segmentation,** SPIE - DOI: 10.1117/12.2521768
- **Evaluation of X-ray Computed Tomography (CT) Images of Additively Manufactured Components using Deep Learning,** NDT.net - DOI: 10.3850/978-981-11-2719-9
- **Effects of Post-Processing Route on Fatigue Performance of Laser Powder Bed Fusion Inconel 718** - Additive Manufacturing - DOI: 10.1016/j.addma.2020.101442
- **Internal surface roughness measurement of metal additively manufactured samples via X-ray CT: the influence of surrounding material thickness -** Surface Topography Metrology and Properties - DOI: 10.1088/2051-672X/ac0e7c
- **On the uncertainty of porosity measurements of additively manufactured metal parts** - Measurement - DOI: 10.1016/j.measurement.2021.110616
- **Automatic Mirror Polishing of Rough, Freeform AM Surfaces Using a Toolpath Generation Framework -** INCASE2021 - DOI: 10.1007/978-981-16-5763-4_56
- **Defect imaging in carbon fiber composites by acoustic shearography** - Composites - DOI: 10.1016/j.compscitech.2022.109417
- _**XCTPore - An Open Source Database for Porosity in X-ray CT scanned components**_ - SINCE2022 _DOI:_ 10.58286/27521
- **Digital Manufacturing Textbook series** - Wrote Chapter B: Robots in intelligent manufacturing, focusing on 3D scanning technology and its post-processing algorithms for robotics and manufacturing application. _Approved Technical editor peer review : Pending publication_

## REFERENCES

References available on request.