Aulia Khilmi Rizgi

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EDUCATIONS

Tokyo Metropolitan University (TMU) Tokyo, Japan
- **Major:** Mechanical Systems Engineering (Master of Engineering) *Apr 2021 – Mar 2023*
- **Study Program:** Robotic Course (Takesue Lab.)
- **ME Coursework:** Adaptive Learning Control, Ubiquitous Robotics, Robot Intelligence
- **Other Coursework:** Shape Modelling, Applied Ergonomics, Interface Design

Politeknik Elektronika Negeri Surabaya (PENS / EEPIS) Surabaya, Indonesia
- **Major:** Electrical Engineering (Bachelor of Engineering) *Jul 2015 – Aug 2019*
- **Study Program:** Electronic Engineering (GPA: 3.48 of 4.00)
- **EE Coursework:** Embedded System, Circuits, Logic Design, Robotics, Intelligent Control, Signal Processing
- **Programming Coursework:** Algorithms, Advanced Programming, Image Processing, Networks

EMPLOYMENT

Formulatrix Inc, Central Java, Indonesia
RnD Software Engineer, Full-Time *Oct 2019 – Jan 2021*
- Collaborated with Software, Firmware, Electronic, and Mechanic Team to build a robot that can perform aspirate/dispense and mix in pre-defined microplate in microvolume.
- Responsible to design the algorithm for liquid handling robot in Linux environment by implementing clean code and design pattern in C# and C++.
- Fixed some bugs of the former code related to robot decision making.

Wahyu Daya Mandiri East Java, Indonesia
Software Engineer, Intern *Jan 2018 – Feb 2018*
- Created a simulation of traffic light for intersection road in both on LAD & FBD Programming Language with PLC Siemens S7-300 and make all the system integrated with SCADA WinCC.
- Redesigned the system of Coal Mining Factory by migrating overall system from LAD and FBD to SCL Programming Language in PLC Siemens S7-300 & SCADA WinCC.

Ide Kreasi Mandiri East Java, Indonesia
Programmer, Freelance *Jan 2015 – Jan 2017*
- Finished project with Jatim Autocomp Indonesia Corporation to create an algorithm for reading data from PDF to database in PHP web-based application and implemented it in the company.
- Finished several projects as a back-end programmer in information system such as hospital, pharmacy, and laboratory with PHP & MySQL.

ACHIEVEMENTS

RoboCup 2019 – *KidSize Humanoid Soccer League* Sydney, Australia
- Round of 16 Competition

Indonesian Robot Contest 2019 – *Humanoid Soccer League* Central Java, Indonesia
- 2nd Place and Best Strategy Awarded in National Competition

Indonesian Robot Contest 2018 – *Humanoid Soccer League* Yogyakarta, Indonesia
- 1st Place in National and Regional Competition
- Best Design Awarded in Regional Competition

RoboCup 2017 – *KidSize Humanoid Soccer League* Nagoya, Japan
- Round of 16 Competition

Indonesian Robot Contest 2017 – *Humanoid Soccer League* West Java, Indonesia

- ◆ 3rd Place in National Competition
- ◆ 2nd Place and Best Strategy Awarded Regional Competition

PROJECTS

Two-Fingers In-Hand Manipulation [Master's Thesis] (2021-Now)
- — Developed two-fingers gripper hand that has an ability to do in-hand manipulation by its active joint on the fingertips while moving an uncommon-shaped object from initial to the desired place.
- — Increased the success ratio to 100% by creating analysis on force control, object surface, and pressure while performing the sequential movement.
- — Created a visualization on RViz and simulation on Gazebo to make it easier to debug and compare the theoretical approach.
- — Utilized: Linux, C/C++, Python, Arduino, ROS, RViz, Gazebo, Cobotta, Dynamixel, Git, Fusion 360

F.A.S.T (Flow Axial Seal Tip) [Formulatrix] (2019-2021)
- — (Team) Developed an object recognition algorithm by using blob detection to recognize the number and position of each tip with the maximum number of tips is 384.
- — (Team) Developed a system to recognize unordered, unwanted fall down tips by employing TensorFlow and Coral.ai to make the robot to be able to avoid a collision by stopping the sequence.
- — Created an algorithm to make the system to be able to enter recovery mode after a collision happened, which previously should reboot the system.
- — Utilized: Linux, C/C++, C#, MSTest, RaspberryPi 3/Zero, OpenCV, Gitlab, OpenProject (SCRUM), CAN, YAML

Walking Control for EROS Humanoid Robot on ROS Platform [Bachelor's Thesis] (2018-2019)
- — Designed overall system for humanoid robot by using a single controller in high-level programming.
- — Created a walking control system by using inverse kinematic and walking trajectory generator.
- — Reduced the error rms of walking stability by 35% by implementing inverted pendulum approach.
- — Utilized: Linux, C/C++, XML, ROS, YAML, RQT Plot, Arduino, PID Control, High-speed Serial Communication

Kid Size Humanoid Robot Soccer (EROS) [Robotic Team] (2016-2019)
- — Developed five autonomous humanoid robot that has an ability to be a soccer player (walk, wake up from fall, recognize and shoot the ball, coordinate, and self-positioning inside the field) for the competition.
- — Created a system to recognize the object inside the field by implementing machine learning.
- — Created an optimized algorithm with cascaded finite state machines to reduce the time of self-decisioning.
- — Developed a debugging system through wireless communication for all robots during soccer competition.
- — Utilized: Linux, C/C++, PHP Shell, ROS, STM32F4, OpenCV, MATLAB, TCP/IP Communication, Git

PUBLICATIONS

[1] **Rizgi, A.,** Risnumawan, A., Ardila, F., Arifin, I., Wijaya, R., Sutoyo, E., Anggraeni, M., and Herawan, T. (2020). Visual Perception System of EROS Humanoid Robot Soccer. International Journal of Intelligent Information Technologies (IJIIT), 16(4), 68-86. http://doi.org/10.4018/IJIIT.2020100105.

[2] **Rizgi, A.,** Risnumawan, A. (2019). Self-Positioning using Field Detection and k-NN Algorithm for Humanoid Robot Soccer. *Tokyo-Tech Indonesia Commitment Award 2019*, Tokyo Institute of Technology, Japan. (*On-Going Published*)

[3] **Rizgi, A.,** Wijaya, R., Arifin, I., Basthomi, M., Priambodo, C., Febrianto, R., Akhyar, I., Anwar, M., Risnumawan, A., and Khalilullah, A. (2019). EROS – Team Description Paper for Humanoid KidSize League, RoboCup 2019. *RoboCup Humanoid League – RoboCup Federation*, pp.1-8.

[4] **Rizgi, A.,** Muhajir, M., Sutoyo, E., Fauzi, I., Febrianto, R., Priambodo, C., Anwar, M., Risnumawan, A., and Anggraeni, M. (2018). Improving Field and Ball Detector for Humanoid Robot Soccer EROS Platform. *20th International Electronics Symposium on Engineering Technology and Application (IES-ETA)*, 20, pp.284-287.

[5] **Rizgi, A.,** Muhajir, M., Sutoyo, E., Arifin, I., Wijaya, R., Basthomi, M., Almutawakkil, A., Akhyar, I., Risnumawan, A., and Anggraeni, M. (2018). Implementation of Balance Recovery by Slight Movement in Humanoid Robot Soccer. *20th International Electronics Symposium on Engineering Technology and Application (IES-ETA)*, 20, pp.101-105.

[6] Sucipto, A., Khalilullah, A., Risnumawan, A., Alasiry, A., Riananda, D., Fauzi, I., **Rizgi, A.**, Wijaya, R., Syahputra, K., Arifin, I., Basthomi, M., and Almutawakkil, A. (2017). Increasing Stability of Shooting Motion on EROS

(EEPIS Robot Soccer) Using Joint Trajectory Controller. *5th Indonesian Symposium on Robotic Systems and Control 2017*, 5, pp.208-211.

CONFERENCE PRESENTATIONS

2018. Rizgi, Aulia Khilmi. "Visual Perception System of EROS Humanoid Robot Soccer." *International Conference on Enhanced Computer Research, Engineering, and Advanced Multimedia*, Yogyakarta, Indonesia.

2018. Rizgi, Aulia Khilmi. "Improving Field and Ball Detector for Humanoid Robot Soccer EROS Platform." *20th International Electronics Symposium on Engineering Technology and Application*, Bali, Indonesia.

SKILLS

Tools: (proficient): C#, C/C++, Linux, ROS, OpenCV (familiar): Python, Fusion 360, MATLAB, PHP, SQL, PLC
Other Skills: Robotics, Electronics, Computer Vision
English Proficiency: TOEIC (790 of 990), EFSET(C2)