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Google Scholar
https://scholar.google.com/citations?user=QDjMkU4AAAAJ&hl=en

SKILLS

- 3D printing
- Fusion 360
- AutoCAD
- Illustrator
- Microcontroller programming (PIC, Arduino, Raspberry Pi)

LANGUAGES

- English
- Japanese (N4)

REFREES

Associate Professor Ahamed Tofael
Institute of Life and Environmental Sciences,
University of Tsukuba, Tsukuba, Ibaraki 305-8577, Japan
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R.M. Rasika D. Abeyrathna

Lecturer- Department of Agricultural Engineering, University of Peradeniya (UoP)

Research interests

- Application of deep Learning/ machine learning in agricultural systems.
- Process control and automation in agricultural systems.
- Orchard robotics and autonomous navigation of farming vehicles.

Academic background

- **Ph.D. in Agricultural Science** – Bioproduction and Machinery Laboratory, Graduate School of Science and Technology, University of Tsukuba, Japan (Oct 2021- Sep 2024).
  - **Research project**- Development of Machine Vision and Laser Sensor-Based Cartesian Robotic System for Apple Harvesting.
- **M.Sc. in Agricultural and Bio-systems Engineering** - Postgraduate Institute of Agriculture, University of Peradeniya (UOP), Sri Lanka (2016- 2017).
  - Cumulative grade point average - 3.94/4.00
  - **Research project**- Development of an Arduino robotic arm feeding mechanism for spices milling process.
- **B.Sc. in Agricultural Technology and Management** - University of Peradeniya (2011 - 2015).
  - Final grade point average - 3.41/4.00 -Second Class Honours (Upper Division)
  - Majoring module: Agricultural and Biosystems Engineering.
  - Final year project- Design and development of far infrared rice flour gelatinizer.

Career history

- 2018- up to date - Lecturer, Department of Agricultural Engineering, Faculty of Agriculture, UoP
- 2018 and 2016 - Assistant Lecturer, Department of Agricultural Engineering, FoA, UoP.
- 2017 - 2018 - Teaching Assistant, Department of Agricultural Engineering, FoA, UoP.
- 2017- Research Assistant, Ruhunu Foods (Pvt.) Ltd., Kandy, Sri Lanka.

Awards

- 2021- 2024 - MEXT Award, University of Tsukuba - Pursuing PhD on Agricultural Automation.
- 2015- Best innovative research in Undergraduate research symposium, Faculty of Agriculture.

Team work

- Power and Audio-Visual committee member - UoP International Research Sessions – 2019.
- E-Learning committee member - Faculty of Agriculture, UoP – 2020.
- Coordinating committee member - World Bank-funded Faculty Development, FoA – 2019.
- Co-controlling examiner - General Certificate Examination Advanced Level, Technology stream – 2018.
- Chairman - Technical Evaluation Committee, Postgraduate Institute of Agriculture, UoP – 2019.

As a Trainee

- Short-term Program of Innovative Asia- Shibaura Institute of Technology, Japan – 2020.
- In-plant Trainee - Ruhunu Foods (Pvt.) Ltd. – 2015.
- In-plant Trainee - Hayleys Agriculture – 2015.
- Out-Bound Training programme – 2015.
- Out-Bound Training programme – 2015.

Membership in societies

- Committee member - Robobot Club -Faculty of Agriculture , UoP - 2021 up to date
- Committee member - Agricultural Engineering Student Society -FoA , UoP - 2021 up to date
- Member of student Art Circle, FoA, UOP – 2013-2015.
- Committee member of Inventors Club, FoA, UOP – 2015.

Publications

Full papers

- Nakaguchi, V. M., **R.M. Rasika D. Abeyrathna.**, Liu, Z., Noguchi, R., & Ahamed, T. (2024). Development of a Machine stereo vision-based autonomous navigation system for orchard speed sprayers. Computers and Electronics in Agriculture, 227, 109669. https://doi.org/10.1016/j.compag.2024.109669.

- Nakaguchi, V. M., **R. M. Rasika D. Abeyrathna**., & Ahamed, T. (2024). Development of a new grading system for quail eggs using a deep learning-based machine vision system. Computers and Electronics in Agriculture, 226, 109433. https://doi.org/10.1016/j.compag.2024.109433.

- **R. M. Rasika D. Abeyrathna**., Nakaguchi, V. M., Liu, Z., Sampurno, R. M., & Ahamed, T. (2024). 3D Camera and Single-Point Laser Sensor Integration for Apple Localization in Spindle-Type Orchard Systems. Sensors, 24(12), 3753. https://doi.org/10.3390/s24123753.

- Liu, Z., **R. M. Rasika D. Abeyrathna**., R., Mulya Sampurno, R., Massaki Nakaguchi, V., & Ahamed, T. (2024). Faster-YOLO-AP: A lightweight apple detection algorithm based on improved YOLOv8 with a new efficient PDWConv in orchard. Computers and Electronics in Agriculture, 223, 109118. https://doi.org/10.1016/j.compag.2024.109118.

- Sampurno, R. M., Liu, Z., **R.M.Rasika D. Abeyrathna**., & Ahamed, T. (2024). Intrarow Uncut Weed Detection Using You-Only-Look-Once Instance Segmentation for Orchard Plantations. Sensors, 24(3), 893. https://doi.org/10.3390/s24030893.

- Minn, A., **R. M. Rasika D. Abeyrathna**., Nakaguchi, V.M., Ahamed, T.,(2023) Development of a 3D Printed New Metering Mechanism for a Multi-Crop Seed Broadcasting System Using an Autonomous Small-Scale Vehicle. Inventions 2023, 8, 69. https://doi.org/10.3390/inventions8030069.

- **R. M. Rasika D. Abeyrathna**., Nakaguchi, V. M., Minn, A., & Ahamed, T. (2023). Recognition and Counting of Apples in a Dynamic State Using a 3D Camera and Deep Learning Algorithms for Robotic Harvesting Systems. Sensors, 23(8), 3810. https://doi.org/10.3390/s23083810.

- **Abeyrathne R.M.R.D**., Ekanayake E.M.A.C., Amaratunga K.S.P.(2020). Industrial Robotic Arm for Chilli Milling Process. International Journal of Innovative Technology and Exploring Engineering (IJITEE). 9(12): 130-133.

- **Abeyrathna, R.M.R.D**., Amaratunga, K.S.P., & Kariyawasam, H.K.P.P. (2017). Design and Development of a Far Infrared Rice Flour Gelatinizer. International Journal of Scientific and Research Publications. 7(1): 36-40.

- **Abeyrathna, R.M.R.D.** & Amaratunga, K.S.P. (2017). Use of heat pump dehumidifiers on industrial drying of chili. International Journal of Scientific and Research Publications. 7(12): 105-110.

- Sewwandi U.G.C., Ekanayake E.M.A.C., Amaratunga K.S.P., Fernando A.J., **Abeyrathne R.M.R.D.** (2019). Drying Characteristics of Katuwelbatu (Solonum virginianum L.) during Heat-Pump Drying. International Journal of Scientific & Engineering Research. 10(10): 1670-1672.

- Ekanayake E.M.A.C., Amaratunga K.S.P., Kariyawasam H. K.P.P., Fernando A. J., **Abeyrathna R. M. R. D.**, (2019) Design and Development of a Closed Cycle Heat Pump Drying System for Industrial Drying of Rice and Chili. Journal of Scientific and Engineering Research, 6(12), pp. 1-7.

Book chapters

- **Abeyrathna, R.M.R.D.**, Ahamed, T. (2024). Approaches for Improving Fruit Detection and Gripping Mechanisms in Orchard Robotic Fruit Harvesting. In: Ahamed, T. (eds) IoT and AI in Agriculture. Springer, Singapore. https://doi.org/10.1007/978-981-97-1263-2_21.

- **Abeyrathna, R.M.R.D.**, Ahamed, T. (2024). Approaches for Improving Fruit Detection and Gripping Mechanisms in Orchard Robotic Fruit Harvesting. In: Ahamed, T. (eds) IoT and AI in Agriculture. Springer, Singapore. https://doi.org/10.1007/978-981-97-1263-2_21.

- **Abeyrathna, R.M.R.D.**, Ahamed, T. (2023). Autonomous Robots in Orchard Management: Present Status and Future Trends. In: Ahamed, T. (eds) IoT and AI in Agriculture. Springer, Singapore. https://doi.org/10.1007/978-981-19-8113-5_17.

- Munirah Hayati Hamidon, Mohammad HussainSeyar, P.D. Kahandage,Victor MassakiNakaguchi, Arkar Minn, Ailian Jiang, **R M Rasika D Abeyrathna** and Tofael Ahamed⁎ (2023). IoT × AI: Introducing Agricultural Innovation for Global Food Production. In: Ahamed, T. (eds) IoT and AI in Agriculture. Springer, Singapore. https://doi.org/10.1007/978-981-19-8113-5_1.

Posters

- **R.M. Rasika D. Abeyrathna**., Nakaguchi, V. M., & Ahamed, T. 2024, 3D camera-based Agricultural Machinery Implement Detection and Automatic Hitching to Avoid Injury in Farm Operations. Conference: Japanese Society of Agricultural Informatics (JSAI). (農業情報学会2024年度年次大会).

- Victor Massaki Nakaguchi., **R.M. Rasika D. Abeyrathna**., Minn, A., & Ahamed, T. 2023, Fracture-based Damage Assessment of Quail Eggs Using Thermal Imaging and Deep Learning Algorithms, Conference: Japanese Society of Agricultural Informatics (JSAI). (農業情報学会2023年度年次大会).

Abstracts

- Nakaguchi, V. M., **R.M. Rasika D. Abeyrathna**., & Ahamed, T. 2024, Real Time Quail Eggs Air Cell Size Assessment Using Thermal Instance Segmentation Algorithms for Freshness Inspection. Conference: Japanese Society of Agricultural Informatics (JSAI). (農業情報学会2024年度年次大会).

- Nakaguchi, V. M., **R.M. Rasika D. Abeyrathna**., & Ahamed, T. 2024, Real Time Quail Eggs Air Cell Size Assessment Using Thermal Instance Segmentation Algorithms for Freshness Inspection. Conference: Japanese Society of Agricultural Informatics (JSAI). (農業情報学会2024年度年次大会).

- Nakaguchi, V. M., **R.M. Rasika D. Abeyrathna**., & Ahamed, T. 2023, Feed Intake Monitoring System for In-cage Breeding Quail Smart Management. Joint Conference on Environmental Engineering In Agriculture 2023 (農業環境工学関連学会 2023 年合同大会 発表要旨集).

- **R.M. Rasika D. Abeyrathna**., Nakaguchi, V. M., & Ahamed, T. 2023, Localization of Apples at the Dynamic Stage for Robotic Arm Operations based on EfficientDet and CenterNet Detection Neural Networks. Joint Conference On Environmental Engineering In Agriculture 2023 (農業環境工学関連学会 2023 年合同大会 発表要旨集).

- Nakaguchi, V. M., **R.M. Rasika D. Abeyrathna**., & Ahamed, T. 2023, Fracture-based Damage Assessment of Quail Eggs Using Thermal Imaging and Deep Learning Algorithms, Conference: Japanese Society of Agricultural Informatics (JSAI). (農業情報学会2023年度年次大会).

- **R.M. Rasika D. Abeyrathna**., Nakaguchi, V. M., Minn, A., & Ahamed, T. 2023, Apple Position Estimation for Robotic Harvesting Using YOLO and Deep-SORT Algorithms, Conference: Japanese Society of Agricultural Informatics (JSAI). (農業情報学会2023年度年次大会).

- **R.M. Rasika D. Abeyrathna**., Nakaguchi Victor Massaki., Ryozo Noguchi., Tofael Ahamed, 2022 Grasping Estimation of Apples for Harvesting from Standardized Orchard Using Yolo-based Object Detection and Mask-RCNN, Conference: Japanese Society of Agricultural Informatics (JSAI). (農業情報学会2023年度年次大会).

- **R.M Rasika D. Abeyrathna**., Tofael Ahamed, 2022. D Pose Estimation using Realsense Camera based on YOLOv3 Darknet for Robotic arm Maipulation. 80th Annual Meeting on The Japanese Society of Agricultural Machinery and Food Engineers (JSAM).

- Wickramahewa W.H.T.D., Amaratunga K.S.P., **Abeyrathna R.M.R.D**., Mowjood M.I.M., Kariyawasam H.K.P.P. & Ekanayake E.M.A.C. (2021). Design and Development of a Coffee Roaster and a Controlling System to Follow Roasting Profiles. Proceedings of the Faculty of Agriculture Undergraduate Research Symposium. Peradeniya: University of Peradeniya.

- Sandanuwan W.I., Amaratunga K.S.P., Mowjood M.I.M., **Abeyrathna R.M.R.D**., Kariyawasam H.K.P.P. & Ekanayake E.M.A.C. (2021). Design and Development of a Far-Infrared Tea (Camellia sinensis) Dryer. Proceedings of the Faculty of Agriculture Undergraduate Research Symposium. Peradeniya: University of Peradeniya.

- Bandara K.M.L.C., Mohotti A.J., Ranil R.H.G., Amaratunga K.S.P.1, **Abeyrathna R.M.R.D**. & Ekanayake E.M.A.C. (2021). Development of a Robot Arm for a Drone based Selective Tea Harvester. Proceedings of the Faculty of Agriculture Undergraduate Research Symposium. Peradeniya: University of Peradeniya.

- Prabath W.M.H.J., Samarakone T.S., Hulugalla W.M.M.P., **Abeyrathna R.M.R.D**., Silva F.H.C.A.& Ekanayake E.M.A.C. (2021). Infrared Thermography as a Method to Evaluate the Heat Stress in Weaned pigs: Relationship between Infrared Measured Body Surface Temperature and Rectal Temperature in Weaned Pigs. Proceedings of the Faculty of Agriculture Undergraduate Research Symposium. Peradeniya: University of Peradeniya.

- Amarasinghe A.A.P.S., Amaratunga K.S.P., **Abeyrathna R.M.R.D**., Mowjood M.I.M., Kariyawasam H.K.P.P. & Ekanayake E.M.A.C. (2021). Modeling and Simulation of the Temperature Profile Inside Coffee Beans Roasted under Far-Infrared Radiation. Proceedings of the Faculty of Agriculture Undergraduate Research Symposium. Peradeniya: University of Peradeniya.

- Chandrasekara K.A.H.D., Nissanka S.P., **Abeyrathna R.M.R.D.** & Vidana Gamage D.N. (2021) Validation of Implexx Sap Flow Sensor to Determine the Crop Water usage of Oil Palm (Elaeis guineensis). Proceedings of the Faculty of Agriculture Undergraduate Research Symposium. Peradeniya: University of Peradeniya.

- Dasanayake, P.D.M.S.C.B., Amaratunga, K. S. P., Jayatissa, D.N., **Abeyrathna, R. M. R. D**., Ekanayake, E.M.A.C., & Pusseatthe, P.G.U.P.D. (2019). Design and Development of an Automated Weighing and Grading Machine for Industrial Applications. Proceedings of the Faculty of Agriculture Undergraduate Research Symposium. Peradeniya: University of Peradeniya.

- Athapaththu A.M.C.M., Amaratunga, K. S. P., **Abeyrathna, R. M. R. D**., Ekanayake, E.M.A.C., & Pusseatthe, P.G.U.P.D. (2019). Application of Image Processing in Sorting Pepper at Industrial Scale. Proceedings of the Faculty of Agriculture Undergraduate Research Symposium. Peradeniya: University of Peradeniya.

- Jayarathna R.P.H.N., Amaratunga, K. S. P., **Abeyrathna, R. M. R. D**., Ekanayake, E.M.A.C., & Pusseatthe, P.G.U.P.D. (2019). Design and Development of a Controlling System to Compensate Discharge Variation due to Material Column Height inside the Silos. Proceedings of the Faculty of Agriculture Undergraduate Research Symposium. Peradeniya: University of Peradeniya.

- Dissanayaka D.M.V.S., Amaratunga, K. S. P., Mowjood M.I.M., **Abeyrathna, R. M. R. D**., Ekanayake, E.M.A.C., & Pusseatthe, P.G.U.P.D. (2019). Design and Development of a Smart Water Monitoring and Control System for Paddy fields. Proceedings of the Faculty of Agriculture Undergraduate Research Symposium. Peradeniya: University of Peradeniya.

- Madubhashitha D.D.S., Amaratunga, K. S. P., **Abeyrathna, R. M. R. D**., Ekanayake, E.M.A.C., & Pusseatthe, P.G.U.P.D. (2019). Design and Development of Sorting Machine for Black Pepper. Proceedings of the Faculty of Agriculture Undergraduate Research Symposium. Peradeniya: University of Peradeniya.

- Chathuranga L.G.R., Amaratunga, K. S. P., **Abeyrathna, R. M. R. D**., Ekanayake, E.M.A.C., & Pusseatthe, P.G.U.P.D. (2019). Development of a Dense-phase Pneumatic Transport System for Paddy. Proceedings of the Faculty of Agriculture Undergraduate Research Symposium. Peradeniya: University of Peradeniya.

- Sewwandi U.G.C., Amaratunga, K. S. P., **Abeyrathna, R. M. R. D**., Ekanayake, E.M.A.C., & Galahitiyawa D.D.K. (2019). Evaluation of Drying Characteristic of Katwelbatu (Solonum virginianum) Plants by Parts in Heat Pump Drying. Proceedings of the Faculty of Agriculture Undergraduate Research Symposium. Peradeniya: University of Peradeniya.

- Wijenayake, H. K. G. S. R., Amaratunga, K. S. P., & **Abeyrathna, R. M. R. D.** (2018). Design and Development of a Raw Material Mixing System for an Automated Curry Powder Milling Process. Proceedings of the Faculty of Agriculture Undergraduate Research Symposium. Peradeniya: University of Peradeniya.

- Dharmathilaka, G. K. A. D. M., Amaratunga, K. S. P., & **Abeyrathna, R. M. R. D.** (2018). Design and Development of an Extruder to Make a Low-Density Polyethylene filament for 3D printing from Waste Material. Proceedings of the Faculty of Agriculture Undergraduate Research Symposium. Peradeniya: University of Peradeniya.

- Usgalhewa, H.P., Amaratunga, K. S. P., & **Abeyrathna, R. M. R. D.** (2018). Development of an Algorithm for Automation of Chilli Feeding Mechanism in Chilli Milling Process for Industrial Application. Proceedings of the Faculty of Agriculture Undergraduate Research Symposium. Peradeniya: University of Peradeniya.

- Sandaruwan, K. A. C., Amaratunga, K. S. P., & **Abeyrathna, R. M. R. D.** (2018). Design and Development of a Continuous Steaming System for Parboiling Paddy. Proceedings of the Faculty of Agriculture Undergraduate Research Symposium. Peradeniya: University of Peradeniya.

- Ekanayaka, E. M. A. C., Amaratunga, K. S. P., Kariyawasam, H. K. P. P., & **Abeyrathna, R. M. R. D.** (2016). Development of a Robotic Arm Feeding Mechanism for Chilli Milling Process. Proceedings of the Faculty of Agriculture Undergraduate Research Symposium. Peradeniya: University of Peradeniya.

- Premachandra, R. T. B. S., Amaratunga, K. S. P., Gunawardana, M., Kariyawasam, H. K. P. P., & **Abeyrathna, R. M. R. D.** (2016). Evaluation of Raw Rice Production Process for the Improvement of Head Rice Yield in CIC Rice Processing Plant at Maho. Proceedings of the Faculty of Agriculture Undergraduate Research Symposium. Peradeniya: University of Peradeniya.

- Bandara, H. L. A. P. G. I. L., Amaratunga, K. S. P., Kariyawasam, H. K. P. P., & **Abeyrathna R. M. R. D.** (2016). Design and Development of a Closed Cycle Heat Pump Drying System for Industrial Drying of Rice and Chilli. Proceedings of the Faculty of Agriculture Undergraduate Research Symposium. Peradeniya: University of Peradeniya.

- Kumara, M. G. M., Amaratunga, K. S. P., Kariyawasam, H. K. P. P., & **Abeyrathna, R. M. R. D.** (2016). Design and Development of a Closed Cycle Heat Pump Drying System for Industrial Drying of selected Spices. Proceedings of the Faculty of Agriculture Undergraduate Research Symposium. Peradeniya: University of Peradeniya

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