# Jayaruwani Fernando

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## Educational Achievements

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|---|---|
| 2018-2022 | **Ph.D.** in Agricultural and Bio-systems Engineering, Postgraduate Institute of Agriculture, University of Peradeniya<br>Thesis title: Optimization of heat pump drying through cascade evaporators and parallel-flow condensers |
| 2015-2017 | **M.S.** in Industrial and Agricultural Technology, Department of Agricultural and Biosystems Engineering, Iowa State University, USA |
| 2012-2015 | **M.Phil.** Agricultural and Biosystems Engineering, University of Peradeniya, Sri Lanka<br>Thesis title: Drying and roasting characteristics of chili (*Capsicum annum* L.) exposed to different wavelengths of far-infrared radiation |
| 2007-2011 | **B.Sc. Agriculture**, Rajarata University of Sri Lanka (Major: Agricultural Engineering)<br>Thesis title: Design and development of a two-wheel tractor driven coconut fertilizer applicator |

**Some of the followed courses in Agricultural and Biosystems Engineering**

***During ISU MS program:***

Food and Bio-process Engineering
Total Quality Improvement
Statistical Methods for Research
Instrumentation for Agricultural and Biosystems Engineering
Grain Processing and Handling System
Advanced Thermodynamics
Applied Categorical Data Analysis

***During University of Peradeniya M.Phil. program:***

Engineering Drawing
Farm Machinery Testing and Evaluation
Water Quality for Agriculture and Environment
Applied Heat Transfer
Physical Properties of Agricultural Products
Principles of Farm Machinery
Fluid Mechanics
Engineering Mechanics
Power and Energy for Agriculture

***During Rajarata University of Sri Lanka B.Sc. program:***

Agricultural Mechanization
Principles of Irrigation
Engineering Drawing and Workshop
Farm Structure Development
Groundwater Hydrology
Agricultural Waste Management
Reservoir Designing and Management
Farm Power and Equipment
Land Survey and Development
Thermodynamics
Irrigation and Water Management
Food Process Engineering
Energy Production and Management
Advanced Agricultural Machinery and Management

(I score up a 3.96/4.00 semester GPA when I started my specialization module in Agricultural Engineering.)

# Teaching/Research Experience

**Senior Lecturer, Rajarata University of Sri Lanka**, 2017 - upto now

Course coordinator and teach the following course:

ES 3206/ES 3204 Food Process Engineering-two-credit course
ES 4102 Design Philosophy-two-credit course
ES 1103 Basic Engineering Physics-two-credit course
ES 3219 Thermodynamics-two-credit course
ES 3205 Innovation and Product Development-two-credit course

Teaching panel:

ES 3102 Field Practices in Agricultural Engineering and Soil Science-three-credit course

**Visiting Lecturer at Aquinas College of Higher Studies, Colombo, Sri Lanka in the degree program of Agro-Industrial Management**, 2021

Course coordinator and teach the following courses:

AIM/CM 12022 Farm Power & Mechanization-two-credit course
AIM/CM 22022 Irrigation & Water Resource Engineering-two-credit course

**Teaching panel, Master of Agriculture, Faculty of Agriculture, Rajarata University of Sri Lanka**, 2020 - upto now

Course:

MS 5203 Advanced Machinery Systems Engineering

**Graduate Research Assistant, Iowa State University (ISU)**, USA, 2015 to 2017

Research on Food security and Lean management

**Lecturer, Rajarata University of Sri Lanka**, 2012 to 2015

Courses:

AS 4116/ES 3206 Food Process Engineering-two-credit course
AS 3215 Food Packaging-two-credit course
AS 1105/AS 1103/ES 1103 Basic Engineering Physics-two-credit course
AS 4118 Design Philosophy-two-credit course
AS 4119 Energy Production and Management-two-credit course
AS 3218 Electronics in Agriculture-two-credit course
AS 1104 Mathematics-two-credit course

**Teaching Assistant, Rajarata University of Sri Lanka, (RUSL)**, 2011 to 2012

Teaching and assessing course assignments related to Agricultural Engineering

# Professional Achievements

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| 2017 | Gamma Sigma Delta Membership - The Honor Society of Agriculture |
| | Alpha Epsilon Membership - The Honor Society of Agricultural Engineering and Biological Systems Engineering |
| | Epsilon Pi Tau Membership - The International Honor Society for Professions in Technology |
| | Grain Elevator and Processing Society (GEAPS) Iowa Chapter Scholarship - The Grain Elevator and Processing Society |
| 2014 | Teacher Accreditation - Staff and Educational Development Association, United Kingdom |
| | Certificate in Teaching in Higher Education, University of Colombo, Sri Lanka |
| 2013 | Most outstanding presenter/Agricultural Engineering - Third annual research symposium, RUSL |
| 2011 | Most outstanding presenter/Agricultural Engineering - Undergraduate research symposium, RUSL |

# Professional Memberships

American Society of Agricultural and Biological Engineers, USA
International Society of Food Engineering

# Professional Training

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| 2020-2022 | Enrolled in Certificate course on Python programming at University of California San Diego Extension. Successfully completed: |
| | Introduction to Programming course (3 credit) |
| | Python Programming Fundamentals course (3 credit) |
| 2021 | Curriculum development |
| | Four-day intensive training on Outcome-based Education and Learner Centered Teaching (OBE-LCT) at University of Peradeniya, Sri Lanka - $22^{nd}$-$25^{th}$ November 2021 |

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| | Four-day intensive training on OBE-LCT at University of Colombo, Sri Lanka - $23^{rd}$-$25^{th}$ February 2021 |
| | Four-day intensive training OBE-LCT at Wayamba University of Sri Lanka - $14^{th}$-$17^{th}$ January 2020 |
| 2016 | Successfully completed following GEAPS courses |
| | GEAPS 520 - Grain Quality Management |
| | GEAPS 521 - Aeration Systems Design and Fan Operational Management |
| | GEAPS 524 - Grain Drying |
| 2011 | Research trainee at National Engineering Research and Development Center (six-month undergraduate research project) |
| 2010 | Successfully completed a training program, Sri Lanka-West German Farm Mechanization, conducted at the Farm Mechanization Training Center in Anuradhapura. Courses included, |
| | Operation and maintenance of farm machinery |
| | Operation and maintenance of two-wheel and four-wheel tractor |
| | Crop cultivation under micro-irrigation |

## Computer Skills

LaTeX
Python Programming
AutoCAD
Arduino Programming
Microsoft Office – MS Word, MS Power Point, MS Excel

## Personal Interests

Vegetable gardening and traveling to foreign countries – have traveled in Australia, USA, France, Italy, India, Thailand, Portugal, Singapore, Austria, Slovakia, Czech Republic, Poland, and Hungary.

## Web Links

Web of Science Researcher ID - AAT-4261-2021
Google Scholar - Jayaruwani Fernando
ORCID - 0000-0003-2292-547X

## Extra Curricular Activities/Community Service

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| 2020-2022 | Serving as a Training of Trainers on Outcome-based Education and Learner Centered Teaching, Faculty of Agriculture, RUSL |
| 2021 | Acting coordinator (03 months) for developing a M.Sc. in Agro-Industrial Technology and Environmental Management, actively organized five meetings to develop course lesson plans. Develop program objectives & program learning outcomes and graduate profile for the program |
| | Online examination preparation committee for conducting online examination for students |
| | Faculty by-law preparation committee member to develop by-law for committees and meetings at the faculty |
| 2020 | Develop two online short courses: Introductory LaTeX and Introduction to Python Programming |
| | Academic sub warden (Student dorm management), Prof. S.H. Upasena hostel, RUSL |
| 2022/19 | Student mentor |
| 2022/18 | Library Committee member at FoA, RUSL |
| 2022/18 | Prepare Student Hand book, Faculty of Agriculture, RUSL |
| 2019 | Served in church Sunday school |
| 2018 | Department coordinator and final grade processing team coordinator at the $11^{th}$ Undergraduate Research Symposium |
| | Member in Program Review document preparation committee |
| 2016 | Moderate a session, Graduate and Professional Students Research Conference, ISU |
| 2014 | Coordinator, Career Guidance, Faculty of Agriculture (FOA), RUSL (Organized career development seminars for three months) |

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| 2013 | Treasurer, FOA Alumni Association, RUSL |
| 2015 | Student Mentor, RUSL |
| | Academic sub warden (Student dorm management), RUSL |
| 2013 | Secretary, Organizing Committee, Third annual research symposium, RUSL |
| 2011 | Deliver the undergraduate speech in my undergraduate research symposium, RUSL |
| 2009/10 | English Debate team – FOA, RUSL |
| 2008 | Women Elle (sport) team – FOA, RUSL |
| | Participate English Quiz competitions, RUSL |
| 2004/02 | Member, School Eastern Band, School prefect |

# Scholarly Works

*Journal Publications*

2022 **Fernando, A. J.**, Amaratunga, K. S. P., Dharmasena, D. A. N., Abeyrathna, R. M. R. D., Gajasinghe, I. L., Weerakoon, H. S. T., Ekanayake, E. M. A. C., and Bandara, D. M. S. P. (2022). Pulse-Width-Modulation control of a heat pump dryer with cascade evaporators and parallel-flow condensers. *Tropical Agricultural Research*, 33(1):9–17

Kavindi, M. A. R., Amaratunga, K. S. P., Ekanayake, E. M. C., **Fernando, A. J.**, and Abesinghe, A. M. S. K. (2022). CFD simulation of airflow distribution in a heat pump assisted deep-bed paddy dryer. *Applied Engineering in Agriculture*, 38(1):1–8

2021 **Fernando, A. J.** and Amaratunga, K. S. P. (2021). Application of far-infrared radiation for sun-dried chili pepper (*Capsicum annum* L.): drying characteristics and color during roasting. *Journal of the Science of Food and Agriculture*, 102(9):3781–3787

**Fernando, A. J.**, Amaratunga, K. S. P., Madushanka, H. T. N., and Jayaweera, H. R. Y. S. (2021b). Drying performance of coffee in a batch-type heat pump dryer. *Transactions of the ASABE*, 64(4):1237–1245

**Fernando, A. J.**, Gunathunga, C., Brumm, T., and Amaratunga, S. (2021d). Drying turmeric (*Curcuma longa* L.) using far-infrared radiation: Drying characteristics and process optimization. *Journal of Food Process Engineering*, 44(9):e13780

Galappaththi, G. M. A. S., Weerasooriya, G. V. T. V., **Fernando, A. J.**, and Senanayaka, D. P. (2021). Development of solar assisted multi-crop dryer. *Sri Lankan Journal of Agriculture and Ecosystems*, 3(1):17–29

2020 Chopra, S. and **Fernando, A. J.** (2020). Modeling employees behavior intention with the adoption of a suggestion system for lean initiatives. *Journal of Technology, Management & Applied Engineering*, 36(2)

2019 Sandaruwan, E. A. A., Weerasooriya, G. V. T. V., and **Fernando, A. J.** (2019a). Design and development of a two-wheel tractor coupled bund plastering and canal (*kiwul-ela*) making equipment. *Sri Lankan Journal of Agriculture & Ecosystems*, 1(1):102–116

Ekanayake, E. M. A. C., Amaratunga, K. S. P., Kariyawasam, H. K. P. P., **Fernando, A. J.**, and Abeyrathne, 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):1–7

Sewwandi, U. G. C., Ekanayake, E. M. A. C., Amaratunga, K. S. P., **Fernando, A. J.**, and 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

2015 **Fernando, A. J.**, Amaratunga, K. S. P., Priyadarshana, L. B. M. D. L., Galahitiyawa, D. D. K., and Karunasinghe, K. G. W. U. (2015). Roasting chilli (*Capsicum annum* L.) using far-infrared radiation. *Tropical Agricultural Research*, 25(2):180–187

Dissanayake, T. M. R., Amarathunga, K. S. P., Thilakaratne, B. M. K. S., Bandara, D. M. S. P., and **Fernando, A. J.** (2015). Gelatinization of rough rice using far-infrared (FIR) radiation. *Tropical Agricultural Research*, 26(4):707–713

Bandara, D. M. S. P., Amarathunga, K. S. P., Thilakaratne, B. M. K. S., Gunawardana, C. R., Dissanayake, T. M. R., Dharmasena, D. A. N., and **Fernando, A.J.** (2015). Use of evaporative water cooling EWC in grinding chili. *Engineer: Journal of the Institution of Engineers, Sri Lanka*, 48(3)

2014 Bandara, D. M. S. P., Amarathunga, K. S. P., Thilakaratne, B. M. K. S., Dissanayake, T. M. R., Dharmasena, D. A. N., and **Fernando, A. J.** (2014). Feasibility study for evaporative cooling of grinding chili (*Capsicum annum* L.). *Tropical Agricultural Research*, 26(1):189 – 194

2013 **Fernando, A. J.**, Adhikarinayake, T. B., and Weerasooriya, G. V. T. V. (2013). Design and development of a two wheel tractor driven coconut fertilizer applicator. *COCOS, Journal of the Coconut Research Institute of Sri Lanka*, 20(1):27–37

## *Thesis Publications*

2022 **Fernando, A. J.** (2022). *Optimization of heat pump drying through cascade evaporators and parallel-flow condensers*. PhD thesis, Postgraduate Institute of Agriculture, University of Peradeniya

2015 **Fernando, A. J.** (2015). Drying and roasting characteristics of chili (*Capsicum annum* L.) exposed to different wavelengths of far-infrared radiation. Master's thesis, Postgraduate Institute of Agriculture, University of Peradeniya

2011 **Fernando, A. J.** (2011). Design and development of a two wheel tractor driven coconut fertilizer applicator. Undergraduate thesis, Faculty of Agriculture, Rajarata University of Sri Lanka

## *Other Publications*

2021

**Fernando, A. J.**, Amaratunga, K. S. P., Weerakoon, S., Gajasinghe, I., and DeSilva, R. (2021c). Algorithm for calculating design parameters of batch type heat pump dryer. In *5th International Conference of the International Commission of Agricultural and Biosystems Engineering (CIGR)*

**Fernando, A. J.**, Amaratunga, K. S. P., Dharmasena, D. A. N., Abeyrathna, R. M. R. D., Gajasinghe, I. L., Weerakoon, H. S. T., Ekanayake, E. M. A. C., and Bandara, D. M. S. P. (2021a). Pulse-Width-Modulation control of heat pump drying through cascade evaporators and parallel flow condensers. In *33rd PGIA Annual Congress*. Postgraduate Institute of Agriculture, University of Peradeniya, Sri Lanka

Gajasinghe, I. L., **Fernando, A. J.**, and Amaratunga, K. S. P. (2021). Maximizing the water condensate in the evaporator of heat pump dryer. In *Proceedings of the 13th Annual Research Symposium*. Faculty of Agriculture, Rajarata University of Sri Lanka

Weerakoon, H. S. T., **Fernando, A. J.**, and Amaratunga, K. S. P. (2021). Design parameters for an optimum batch-type heat-pump drying process. In *Proceedings of the 13th Annual Research Symposium*. Faculty of Agriculture, Rajarata University of Sri Lanka

2020

**Fernando, A. J.**, Amaratunga, K. S. P., Madhushanka, H. T. N., and Jayaweera, H. R. Y. S. (2020). Drying performance of coffee in a batch-type heat pump dryer. ASABE Annual International Meeting, USA

Jayaweera, H. R. Y. S., **Fernando, A. J.**, and Amaratunga, K. S. P. (2020). Feedback control system with pulse width modulation to control wavelength of infrared radiation. In *Proceedings of the 12th Annual Research Symposium, Faculty of Agriculture, Rajarata University of Sri Lanka*. Faculty of Agriculture, Rajarata University of Sri Lanka

Madushanka, H. T. N., **Fernando, A. J.**, and Amaratunga, K. S. P. (2020). Drying characteristics of coffee in an industrial scale heat pump drying system. In *Proceedings of the 12th Annual Research Symposium, Faculty of Agriculture, Rajarata University of Sri Lanka*

Wimalaweera, T. P. M., **Fernando, A. J.**, Weerasooriya, G. V. T. V., and Bandara, D. M. S. P. (2020). Drying characteristics of paddy in a hot-air batch dryer. In *Proceedings of the 12th Annual Research Symposium, Faculty of Agriculture, Rajarata University of Sri Lanka*. Faculty of Agriculture, Rajarata University of Sri Lanka

Gunathunga, H. D. C. N. K., **Fernando, A. J.**, and Amaratunga, K. S. P. (2020). Feasibility of applying far-infrared radiation for drying turmeric. In *Proceedings of the 12$^{th}$ Annual Research Symposium, Faculty of Agriculture, Rajarata University of Sri Lanka*. Faculty of Agriculture, Rajarata University of Sri Lanka

2019 Galappaththi, G. M. A. S., Senanayaka, D. P., Weerasooriya, G. V. T. V., and **Fernando, A. J.** (2019). Design and development of a multi crop hot air solar dryer. In *Proceedings of the 11$^{th}$ Annual Research Symposium, Faculty of Agriculture, Rajarata University of Sri Lanka*, page 80

Sandaruwan, E. A. A. S., Weerasooriya, G. V. T. V., and **Fernando, A. J.** (2019b). Design and development of a two-wheel tractor coupled bund plastering and canal (*kiwul-ela*) making equipment. In *Proceedings of the 11$^{th}$ Annual Research Symposium, Faculty of Agriculture, Rajarata University of Sri Lanka*, page 81

2016 **Fernando, A. J.** and Chopra, S. (2016). Process improvement software platform for lean management in the healthcare sector. The Association of Technology, Management, and Applied Engineering, ATMAE Annual Conference

2014 **Fernando, A. J.**, Amaratunga, K. S. P., and Priyadarshana, L. B. M. D. L. (2014a). Far-infrared drying of stored coriander (*Coriandrum sativum* L.) up to grinding moisture content. In *Proceedings of the International Research Symposium on Postharvest Technology*, pages 121–124. Institute of Postharvest Technology, Jayanthi Mawatha, Anuradhapura

**Fernando, A. J.**, Amaratunga, K. S. P., Priyadarshana, L. B. M. D. L., Galahitiyawa, D. D. K., and Karunasinghe, K. G. W. U. (2014b). Far-Infrared radiation roasting colour of chilli. In *Proceedings of IBA-IC*, pages 62–71. International Conference on India at the cross roads: The Way Ahead

Panadura, S. L., Yalegama, L. L. W. C., and **Fernando, A. J.** (2014). Effect of drying efficiency on quality of coconut oil. In *Proceedings of the Special Sessions on Green Technology and Green Energy, Fifth International Conference of Sustainable Built Environment*, volume 3, pages 67–74

Zakeel, M. C. M. and **Fernando, A. J.** (2014). Learning style preference of a group of students attached to the Faculty of Agriculture, Rajarata University of Sri Lanka. pages 27–30. Proceedings of 10$^{th}$ Staff Development Centre- Sri Lanka Association for Improving Higher Education Effectiveness (SLAIHEE) Higher Education Conference

Dhanushika, D. D. I., Samaranayake, H. A. E., and **Fernando, A. J.** (2014). Kinetics of osmotic dehydration in coconut (*Cocos nucifera* L.) chips. page 16. Proceedings of the 6$^{th}$ annual research symposium at Faculty of Agriculture, Rajarata University of Sri Lanka

Jayasiri, M. M. J. G. C. N., Weerasooriya, G. V. T. V., Kahandage, P. D., and **Fernando, A. J.** (2014). Design, development and testing of a manually operated pineapple harvester. In *Proceedings of International Conference of Agricultural Science*. Faculty of Agricultural Sciences, Sabaragamuwa University of Sri Lanka

2013 Hapuarachchi, A. S. K., Weerasooriya, G. V. T. V., Kahandage, P. D., and **Fernando, A. J.** (2013). Design, development and testing of small scale pepper harvester. page 85. Fifth undergraduate research symposium, Rajarata University of Sri Lanka

Dissanayaka, L. D. U. D. B., Bandara, M. H. M. A., Weerasooriya, G. V. T. V., Fernando, A. P. S., and **Fernando, A. J.** (2013). Assessment of potential and adaption of farm machineries by vegetable and potato cultivators in Nuwara Eliya District. In *Fifth undergraduate research symposium*, page 80. Faculty of Agriculture, Rajarata University of Sri Lanka

2012 Dassanayake, A. D. S. L., Bandara, M. H. M. A., Weerasooriya, G. V. T. V., and **Fernando, A. J.** (2012). Performance of a newly fabricated finger millet processing machine. pages 261–263. Proceedings of the International symposium on Agriculture and Environment, University of Ruhuna

## *Recent Conference Presentations*

2021 **Fernando, A. J.**, Amaratunga, K. S. P., Dharmasena, D. A. N., Abeyrathna, R. M. R. D., Gajasinghe, I. L., Weerakoon, H. S. T., Ekanayake, E. M. A. C., and Bandara, D. M. S. P. (2021, November 16–17). Pulse-Width-Modulation control of heat pump drying through cascade evaporators and parallel flow condensers. In *33$^{rd}$ PGIA Annual Congress*. Postgraduate Institute of Agriculture, University of Peradeniya, Sri Lanka

**Fernando, A. J.**, Amaratunga, K. S. P., Weerakoon, S., Gajasinghe, I., and DeSilva, R. (2021, May 10–14). Algorithm for calculating design parameters of batch type heat pump dryer. In *5$^{th}$ International Conference of the International Commission of Agricultural and Biosystems Engineering (CIGR)*

**Fernando, J.** and Rosentrater, K. (2021, July 12–16). Overview of heat pump drying of agricultural products. ASABE Annual International Meeting, USA

2020 **Fernando, A. J.**, Amaratunga, K. S. P., Madhushanka, H. T. N., and Jayaweera, H. R. Y. S. (2020, July 13–15). Drying performance of coffee in a batch-type heat pump dryer. ASABE Annual International Meeting, USA

### *Peer Reviewed Journals*

- Journal of the Science of Food and Agriculture
- Computers in Human Behavior
- Agricultural Engineering International: CIGR Journal
- Journal of Food Processing and Preservation
- Rajarata University Journal

### *Reviewed Abstracts*

- Annual undergraduate symposiums at Faculty of Agriculture, Rajarata University of Sri Lanka
- ISAE 2020, Ruhuna University

### *Selected Supervised Undergraduate Projects*

- Maximizing the water condensate in the evaporator of heat pump dryer
- Design parameters for an optimum batch-type closed-loop heat pump drying process
- Design and development of a multi-crop hot air solar dryer
- Kinetics of osmotic dehydration in coconut chips
- Design and development of a two-wheel tractor coupled bund plastering and canal (*kiwul-ela*) making equipment
- Feedback control system with pulse width modulation to control wavelength of infrared dryers
- Feasibility of applying infrared radiation for drying turmeric
- Drying characteristics of coffee in an industrial scale heat pump drying system
- Performance evaluation of hot-air batch dryer for paddy

### *Patents*

- A pull-type bund plastering and canal (*kiwul-ela*) making machine - Patent No: 20513