Eduardo Duque Dussán

MECHANICAL AND CHEMICAL ENGINEER

Details

K Dolum 73/95, Prague, Czech Republic
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Links

ResearchGate

LinkedIn

Website

Software Skills

Solidworks, AutoCAD, AVEVA E3D, Navisworks.

Ansys, Forge, COMSOL Multiphysics, Abaqus, Fluent.

COCO Simulator, MatLab

Microsoft Office

Languages

Spanish

English

Czech

Portuguese

German

Hobbies

Reading, writing, art, football, scuba diving, trekking, judo, and gardening.

Employment History

Scientific Researcher at Faculty of Tropical AgriSciences CZU, Prague

SEPTEMBER 2020 — PRESENT

- Research and science in waste management technology design.
- Mechanical engineering with technical drawings and documentation.
- Development projects and teaching.
- Expertise in food drying technologies and food characterization.

Catedratic Lecturer at Universidad de Caldas, Manizales

NOVEMBER 2019 — NOVEMBER 2022

Lecturer of Fluid Mechanics, Mechanical Design, Mechanisms and Dynamics in the Mechatronics Engineering programme.

Discipline Engineer at Bilfinger Tebodin, Prague

AUGUST 2020 — AUGUST 2022

- Piping design for different industries (food, chemical automotive, petrochemical, etc.) and plant layout generation.
- Planning and monitoring engineering and other design activities.
- Advise internal and external customers regarding design, costs, and planning to achieve a better design.
- Projects: Clariant Sunliquid (Bioethanol plant – Romania); Umicore (Cathode materials plant – Poland); Net4Gas (Gasoduct – Czech Republic); Viterra (Canola Oil Plant – Czech Republic); Doosan ECube (Copper thin foil plant – Hungary); Huntsman Falcon (Biorefinery – Hungary); Mondelez - Bosch (Milka Production line Re-Design – Germany, Austria, and Switzerland).

Senior Design Engineer at Herragro S.A., Manizales

AUGUST 2019 — AUGUST 2020

- Design of dies, stamps, and press parts for the hot forging process.
- Design and develop new products and projects in R&D.
- Precision parts design for the automotive and military industries.
- Design of processes, equipment and machinery aimed at the efficiency and economic savings of the company.
- Perform the finite element analysis of the forging process on new or redesigned products.

Discipline Designer at Bilfinger Tebodin, Prague

JULY 2018 — JULY 2019

- Support the mechanical department in all the projects from the mechanical engineering and process engineering point of view.
- Perform specific tasks related to process engineering, such as equipment design, PFD and P&ID creation, process design, etc.

Design Engineer at TOTPEC S.A., Manizales

JUNE 2016 — SEPTEMBER 2017

- Responsible for developing new projects to improve the fibre cement sheet production process.
- Support the maintenance department by redesigning machinery and drawing technical blueprints of equipment for fabrication.
- Responsible for generating projects (over $10M) and executing them by the means of the PMI standards and PMBOK.

Services Engineer at Buencafé Liofilizado de Colombia, Chinchiná

JANUARY 2016 — JUNE 2023

- Develop innovative processes in the service area of the freeze-dried coffee plant.
- In charge of the service area, including the Wastewater treatment plant, steam generation plant, absorption and compression refrigeration plants, toaster, and green coffee silos.
- In charge of executing projects willing to increase the energy efficiency in the whole steam line of the factory.

Design and Maintenance Engineer at Básculas y Suministros S.A.S, Manizales

JULY 2015 — JANUARY 2016

- In charge of the mechanical design area: design new weighing and dosing elements such as scales, gauges, hoppers, and machinery in general for related applications in the industry.
- Supervise the assembly, installation and maintenance of the equipment requested by the client.

Maintenance Chief at Constructora CGM, Manizales

FEBRUARY 2014 — MARCH 2015

- Design maintenance routines for construction equipment and keep them up to date as well for supervising maintenance procedures.
- Direct the construction schedule for civil works and the design, execution, and control of projects.
- Advise, inspect, and verify the installation and maintenance of equipment for civil construction in the construction of the building "Portal de Campo Hermoso".

Education

PhD Sustainable Technologies, Czech University of Life Sciences, Prague

SEPTEMBER 2020 — NOVEMBER 2023

Thesis: Design and Evaluation of a Hybrid Solar Tunnel Dryer for Parchment Coffee in Colombia

MBA, ESNECA Business School, Madrid

JANUARY 2020 — OCTOBER 2021

MSc Process Engineering, Czech Technical University, Prague

SEPTEMBER 2017 — JUNE 2019

Thesis: Coffee Beans Dryer for Decentralized Purposes

Mechanical Engineer, Universidad Autónoma de Manizales, Manizales

JULY 2010 — JUNE 2016

Thesis: Energy Efficiency Evaluation of the Manufacturing Companies from Central-Southern Caldas.

Certifications

- Mechanical Design Professional (CSWP) - Solidworks.
- Professional: Advanced Surfaces, Weldments, Drawing Tools, Sheet Metal - Solidworks.
- Project Management - International Business Management Institute, Berlin.

Scientific Activities

Publications

Duque - Dussán, E., Figueroa-Varela, P.A., & Sanz-Uribe, J. R. (2023). *Peaberry Shape and Size Influence on Different Coffee Postharvest Processes*. Journal of Food Process Engineering, e14461. https://doi.org/10.1111/jfpe.14461.

Duque - Dussán, E., Sanz-Uribe, J. R., & Banout, J. (2023). *Design and evaluation of a hybrid solar dryer for postharvesting processing of parchment coffee.* Renewable Energy, 215(March), 118961. https://doi.org/10.1016/j.renene.2023.118961

Duque - Dussán, E., Sanz-Uribe, J. R., Dussán-Lubert, C., & Banout, J. (2023). *Thermophysical properties of parchment coffee: New Colombian varieties.* Journal of Food Process Engineering, December 2022, 1–13. https://doi.org/10.1111/jfpe.14300

Duque - Dussán, E., & Banout, J. (2022). *Improving the drying performance of parchment coffee due to the newly redesigned drying chamber.* Journal of Food Process Engineering, 45(12). https://doi.org/10.1111/jfpe.14161

Duque - Dussán, E., Villada-Dussán, A., Roubík, H., & Banout, J. (2022). *Modeling of Forced and Natural Convection Drying Process of a Coffee Seed.* Journal of the ASABE, 65(5), 1061–1070. https://doi.org/10.13031/ja.15156

Cardona, C. I., Tinoco, H. A., Perdomo-Hurtado, L., **Duque - Dussan, E.**, & Banout, J. (2022). *Computational Fluid Dynamics Modeling of a Pneumatic Air Jet Nozzle for an application in Coffee Fruit Harvesting.* 2022 International Conference on Electrical, Computer and Energy Technologies (ICECET), July, 1–7. https://doi.org/10.1109/ICECET55527.2022.9872877

Conferences

Enhancing Selective Coffee Harvesting in Challenging Terrains: A Modal Analysis and Vibration-Based Approach. 4th Multidisciplinary Conference for Young Researchers (MCYR) October 2023. Prague Czech Republic.

Moisture Management in Solar Drying of Coffee: Comparing Different Methods to Prevent Remoisturizing. 4th Multidisciplinary Conference for Young Researchers (MCYR) October 2023. Prague Czech Republic.

Hybrid tunnel solar dryer for coffee processing in Colombia: Design and experimental evaluation. Tropentag Conference September 21, 2023. Berlin, Germany.

Thermophysical properties of Coffee: New Colombian Varieties. Scientific Seminars, National Coffee Research Center of Colombia (Cenicafé). April 24, 2023, Manizales, Colombia.

Using Image Analysis and Finite Element Methods to Study the Linear Heat Transfer in Parchment Coffee Drying. ELLS Conference. Sept 2022. Prague, Czech Republic.

Coffee Bean Drying Shrinkage Comparison by Finite Element Simulations and Real Image Processing. Tropentag Conference September 22, 2022. Prague, Czech Republic.

Computational Fluid Dynamics Modeling of a Pneumatic Air Jet Nozzle for an Application in Coffee Fruit Harvesting. International Conference on Electrical, Computer and Energy. 20-22 July 2022, Prague, Czech Republic.

Using Vetiver Grass Wetlands for Improved Coffee Wet Processing Wastewater Treatment. International Scientific and Advanced Conference: "PROSPECTS OF BIOENERGY CROPS FEEDSTOCK PRODUCTION ON RECLAIMED MINE LANDS" 23-24 June 2022, Dnipro, Ukraine.

Drying Process Improvement of a Cacao Beans Hybrid Solar Dryer. CASEE Conference "Sustainable agriculture in the context of climate change and digitalization" 22-24 June 2022, Prague, Czech Republic.

Effects of Different Drying Methods on Organoleptic Properties of Traditional Vietnemese Beef and Buffalo Jerky. 2nd MULTIDISCIPLINARY CONFERENCE "Sustainable Development Trends and Challenges under COVID-19" 29-30 November 2021, Sumy, Ukraine.

Coffee Seed Drying Predictive Finite Element Model. 2nd MULTIDISCIPLINARY CONFERENCE "Sustainable Development Trends and Challenges under COVID-19" 29-30 November 2021, Sumy, Ukraine.

Solar Drying Applications in Conventional Vietnamese Beef Jerky Preparation. Green (r)evolution: from molecules to ecosystems. ELLS Conference 2021. 19-20 November 2021, Warsaw, Poland.

A Review about Induced Polyploidization in the Medicinal Species of the Lamiaceae Family. IX COLAPLAMED Latin American Congress of Medicinal Plants. 13-15 October 2021, Quito, Ecuador.

Operational Improvement of a Convective Coffee Dryer by Numerical Methods and Computational Fluid Dynamics. Tropentag 2021 Conference. 15-17 September 2021, Hohenheim, Germany.

Development Projects

Novel Systemic Advisory Tool to Reduce Food Loss and Waste in Cambodia (NOSATOR-FLOW). Target country: Cambodia. Responsibilities: Machine design for food processing, chemical engineering expert, project manager.

Higher Himalaya. Target country: Nepal. Responsibilities: YCRAC Scientific Mentor, IAAS – FAO.

Through Biogas Technology towards Higher Resilience of Communities in Western Province of Zambia. Target country: Zambia. Responsibilities: Mechanical design and chemical engineering expert.

Strengthening scientific capacities and cooperation of Ukrainian universities in AgriSciences. Target country: Ukraine. Website www.agrisci-ua.com. Responsibilities: Mechanical design and chemical engineering expert.

Research Groups

Biogas Research Team – Faculty of Tropical AgriSciences, Czech University of Life Sciences.

Food Security - Faculty of Tropical AgriSciences, Czech University of Life Sciences.

Postharvest Technologies – National Coffee Research Centre (Cenicafé), Colombia.