Brhayan Stiven Puentes Rodríguez

Research Assistant
MSE - Purdue University
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Summary

- Research experience on microstructure development in materials processing
- Development and processing of high resistivity electrical steel alloys.
- Design, development, and testing of cost-effective material technologies to meet engineering specifications.
- Hands-on oriented with vast lab experience including deformation, machining and powder processes, heat treatments, and microstructural characterization techniques.
- Leader skilled at creating a productive, safe, and enjoyable working atmosphere.
- Trained on public speaking and communication skills

Education

Ph.D. in Materials Engineering Expected Summer 2022
Purdue University, West Lafayette, IN.
Research topic: "Production of High-Resistivity Electrical Steel Alloys Strips by Free Cutting and Hybrid Cutting Extrusion."

Teaching and Learning in Engineering Graduate Certificate Expected Fall 2021
Purdue University, West Lafayette, IN.

Bachelor of Science, Mechanical Engineering May 2017
National University of Colombia, Bogotá D.C., Colombia

Work Experience

Graduate Research Assistant Aug 2017 – to the present
Purdue University, West Lafayette, IN, USA.
Advisor: Prof. Kevin Trumble, and Prof. Srinivasan Chandrasekar.
- Developed high-resistivity electrical steel alloys with improved workability for electrical motor applications.
- Participated in the design and implementation of the scale-up process to produce 2 inches strips of experimental electrical steel alloys by cutting processes (free cutting and hybrid cutting extrusion).

Undergrad Research Assistant Aug 2016 – Aug 2017
National University of Colombia, Bogotá D.C., Colombia
Advisor: Prof. Liz Karen Herrera.

- Participated in the creation and implementation of a powder metallurgical production process route at the National University of Colombia.
- Designed and manufactured a forming die for production of WC-Co inserts via powder metallurgy.

Visiting Scholar – Internship: COLCIENCIAS - NEXO GLOBAL Scholarship — Jan 2016 – Jul 2016

Purdue University, West Lafayette, IN, USA.

Advisors: Prof. Kevin Trumble, and Dr. James Mann.

- Developed capability for powder flow measurements.
  Completed a fundamental study on metal particle shape effects on flowability.

Teaching Experience

Instructor — Summer 2021 – Fall 2021

Purdue University, West Lafayette, IN, USA.

Instructor in charge of the course MSE 235 "Materials Properties Lab".

Instructed and trained undergrads in material fundamental concepts like technical communication, XRD, metallography, mechanical properties, fracture, thermal properties, & phase diagrams.

Graduate Teaching Assistant — Summer 2018

Purdue University, West Lafayette, IN, USA.

- Instructed laboratory section of the course for the three sections, metals, ceramics, and polymers**.**
- Helped updating the laboratory guides and trained TAs for subsequent semesters.
- Enforced good practices and laboratory safety within the students.

Undergrad Teaching Assistant — Jan 2017 - May 2017

- Instructed laboratory section.
- Wrote SOPs for sintering furnace and density scale.
- Guided student's final projects related to processing of WC powders.

Professor's Assistant — Aug 2016 – Dec 2016

National University of Colombia, Bogotá D.C., Colombia.

Assisted professor Liz Karen Herrera on the development of the course manufacturing processes 1.

Mentorship Experience

UREP-C Mentor — Spring & Summer 2021

UREP-C stands for "Undergrad Research Experience Purdue – Colombia".

Mentee: Theylor Amaya Villareal

UREP-C Mentor June 2018 – Dec 2018

UREP-C stands for "Undergrad Research Experience Purdue – Colombia".

- Mentees: Luis Miguel Leon & Juan Antonio Barragan

Honors and Awards

- Purdue Engineering Dean's Teaching Fellowship
  - Purdue University - 2021
- Briney Achievement Award
  - Purdue University - 2020
- Nexo Global Scholarship
  - COLCIENCIAS (Colombia) - 2016

Skills

- **Materials Characterization**: Metallurgical preparation, optical microscopy, Scanning Electron Microscopy, EBSD, XRD, profilometry, & mechanical properties.
- **Laboratory Skills**: Casting, deformation processes, machining, heat treatments, laboratory safety.
- **Software Skills:** SOLIDWORKS, AUTODESK INVENTOR, CNC Programing, AUTODESK MECHANICAL SIMULATION – FEM, OriginLab, ImageJ, MATLAB, LaTeX, PROTEUS 8 PROFESSIONAL.
- **Professional Skills:** Research project management, technology development, teamwork oriented, public speaking, lab oriented, lab safety, Spanish fluent.

Languages

- Spanish – Native
- English – Fluent

Complementary Studies

SENA (National Learning Service), Bogotá D.C., Colombia. Jun 2015

Special course in synchronization of OBD – ii. Electronic injection system, 40 hours.

SENA (National Learning Service), Bogotá D.C., Colombia. Dec 2014

BASIC HANDLING OF CATIA V5 FOR THE DESIGN OF NEW PRODUCTS, 40 hours

SENA (National Learning Service), Bogotá D.C., Colombia. Nov 2014

Parameter relationships of the plastic injection process for the quality of the product, 40 hours.

VIVAPALABRA (Cultural Corporation), Medellín, Ant., Colombia. Dec 2011

Basic level in the school of storytelling and orality, 130 hours.

Publications

- Mann, J., Saei, M., Udupa, A., **Puentes-Rodriguez, B. S.,** & Sagapuran, D. (2020). Applications of Machining in Materials Manufacturing. In Proceedings of the ASME 2020 15th International Manufacturing Science and Engineering Conference.
- **Puentes-Rodriguez, B. S.**, Brice, D., Mann, J. B., Chandrasekar, S., & Trumble, K. (2019). Production of High-Resistivity Electrical Steel Alloys by Substitution of Si with Al and Cr. In TMS 2019 148th Annual Meeting & Exhibition Supplemental Proceedings (pp. 599-606). Springer, Cham.

Conferences, and Seminars.

- **Puentes, B**., Mann, J. B., Chandrasekar, S., & Trumble, K. (2020). "Low-loss Soft Magnetic Alloys by Cutting Processes". TMS 2020 — Feb 2020
- Trumble, K., **Puentes, B**., Issahaq, M., Saei, M., Udupa,A., Mann, J. B., Chandrasekar, S. (2020). "Hybrid Cutting-Extrusion for Sheet Metal Production with Exceptional Microstructure Control". TMS 2020 — Feb 2020
- **Puentes, B**., Brice, D., Mann, J. B., Chandrasekar, S., & Trumble, K. (2019)." Production of High-Resistivity Electrical Steel Alloys by Substitution of Si with Al and Cr" TMS 2019 — March 2019
- Gil A., **Puentes B.,** Ardila L, Herrera L. "Creation and implementation of a powder metallurgical production process at the National University of Colombia. Hard Metal Microstructural Evolution." VI National Conference, and I Ibero-american Conference of Powder Metallurgy**.** Ciudad Real – Spain. — Jun 2017
- **Puentes B., Mann J.**, Trumble K. "Effects of particle shape, size, and size distribution on powder flowability." NEXO GLOBAL Symposium, Purdue University (2016). — Jul 2016

Leadership and Extracurricular Activities

Materials Science and Engineering Graduate Student Association (MSEGSA) – President 2019-2020.
Co-wrote grants to fund and coordinate events to improve graduate student life through events that promoted professional development, academic growth, cultural awareness, and a healthy lifestyle.
Students Training – MSE Purdue
Throughout my time at Purdue University I have trained several MSE and non-MSE students on techniques and equipment like: Rolling, forging, induction melting furnace, heat treatments, surface grinder, machining, hardness testing, and metallography. Also, I have supported MSE 367 several times by training new teaching assistants, replacing teaching assistants, and supporting professor Trumble on Spring 2019 when he did not have an official TA for the metals section.