

Andres Mauricio Bejarano Posada

abejara@purdue.edu

<http://andresbejarano.name/>

Updated: May 29th, 2021

Education

- August 2014 **Ph.D. in Computer Science**
To May 2020 *Purdue University, West Lafayette, Indiana, USA*
- August 2014 **M.Sc. in Computer Science**
To May 2017 *Purdue University, West Lafayette, Indiana, USA*
- February 2009 **Master's in Systems Engineering and Computation**
To November 2012 *Universidad del Norte, Barranquilla, Colombia*
- January 2004 **Bachelor's in Systems Engineering**
To March 2009 *Universidad del Norte, Barranquilla, Colombia*

Research and Professional Experience

- August 2020 **Visiting Assistant Professor**
To Present *Department of Computer Science, Purdue University, West Lafayette, Indiana, USA*
Teaching Fundamentals of Computer Science and Data Structures and Algorithms. Mentoring students on miscellaneous Computer Science and Software Development topics.
- May 2016 **Research Associate**
To May 2020 *Rosen Center for Advanced Computing, Purdue University, West Lafayette, Indiana, USA*
Designed and proposed system architectures to support the curation, archiving, preservation, dissemination, and experiment replicability for multi-disciplinary research datasets.
- May 2018 **Software Engineer Intern**
To August 2018 *DirectX Driver Development Team, NVIDIA Co., Durham, North Carolina, USA*
Improved the internal APIC minimizer debugging tool by including automatic resource and draw calls identification in an APIC trace for rendering on a region of interest in a frame.
- August 2014 **Graduate Teaching Assistant**
To May 2016 *Department of Computer Science, Purdue University, West Lafayette, Indiana*
Provided discussions and review sessions to clarify concepts on algorithms, data structures, and computer graphics. Designed course evaluation activities.
- March 2014 **Research Assistant**
To February 2015 *GRECIS Research Group, Dept. of Sysys. Eng. and Comp., Universidad del Norte, Barranquilla, Col.*
Explored the applications and trends of smart home environments from research publications and existing commercial solutions. Proposed the architecture of a low-cost smart home system based on embedded hardware.
- July 2010 **Adjunct Professor**
To June 2014 *Department of Systems Engineering and Computation, Universidad del Norte, Barranquilla, Col.*
Instructed on Algorithms and Programming, Fundamentals of Computer Graphics, Mobile App Development, and Multimedia for Communications. Advised 6 senior final projects groups (10 students in total).

- September 2011 **Software Engineer**
 To November 2011 *Information Technology and Communications Office, Universidad del Norte, Barranquilla, Col.*
 Designed and developed web platforms to manage user-access privileges to selected systems and internal databases. Managed the university's online radio station server and antispyam services.
- February 2009 **Research Assistant**
 To December 2009 *TRANVIA Research Group, Dept. of Civil Engineering, Universidad del Norte, Barranquilla, Col.*
 Supported the survey data collection activities by curating and managing the collected data. Led survey activities for international air traveler data collection.

Journal Publications

- 2020 Hewa Nadungodage, C., Catlin, A. C., **Bejarano, A.**, Clark, S., Wickramaarachchi, G., Fernando, S., Desigavinayagam, P. (2020) The DEEDS platform: Support for integrated data and computing across the research lifecycle. *Future Generation Computer Systems*.
<https://doi.org/10.1016/j.future.2019.10.031>
- 2019 **Bejarano, A.**, Hewa Nadungodage, C., Wang, F., Catlin, A. C., Hoag, S. W. (2019). Decision Support for Excipient Risk Assessment in Pharmaceutical Manufacturing. *AAPS PharmSciTech*, 20(6), 223. <https://doi.org/10.1208/s12249-019-1440-x>
- Bejarano, A.**, Hoffmann, C. (2019). A Generalized Framework for Designing Topological Interlocking Configurations. *International Journal of Architectural Computing*, 17(1), 53–73.
<https://doi.org/10.1177/1478077119827187>
- Catlin, A. C., Hewa Nadungodage, C., **Bejarano, A.** (2019). Lifecycle Support for Scientific Investigations: Integrating Data, Computing, and Workflows. *Computing in Science & Engineering*, 21(4), 49–61. <https://doi.org/10.1109/MCSE.2019.2901433>
- 2018 Catlin, A. C., Hewa Nadungodage, C., Laughery, L., Sim, C., Puranam, A., **Bejarano, A.** (2018). A Cyberplatform for Sharing Scientific Research Data at DataCenterHub. *Computing in Science & Engineering*, 20(3), 49–70. <https://doi.org/10.1109/MCSE.2017.3301213>
- 2017 **Bejarano, A.**, Jindal, A., Bhargava, B. (2017). Measuring User's Influence in the Yelp Recommender System. *PSU Research Review*, 1(2), 91–104. <https://doi.org/10.1108/PRR-02-2017-0016>
- 2016 **Bejarano, A.**, Fernandez, A., Jimeno, M., Salazar, A., Wightman, P. (2016). Towards the Evolution of Smart Home Environments: A Survey. *International Journal of Automation and Smart Technology*, 6(3), 105–136. <http://dx.doi.org/10.5875/ausmt.v6i3.1039>
- 2013 **Bejarano, A.**, Garcia, L., Zurek, E. (2013). Detection of Source Code Similitude in Academic Environments. *Computer Applications in Engineering Education*, 23(1), 13–22.
<https://doi.org/10.1002/cae.21571>

Conference Publications

- 2020 **Bejarano, A.**, Hoffmann, C. (2020) TIGER: Topological Interlocking GEnerator. In *IEEE GMAX 2020*, September 17-18, 2020, Universidad del Norte, Barranquilla, Colombia.
<https://doi.org/10.1109/GMAX49668.2020.9256836>
- 2018 Catlin, A. C., Hewa Nadungodage, C., Clark, S., Fernando, S., Wickramaarachchi, G., **Bejarano, A.**, Patil, O. (2018). Fully Integrating Data with Compute Workflows: A Platform to Better Serve

Scientific Research. Gateways 2018: The 13th Gateway Computing Environments Conference. Presented at the University of Texas at Austin. <https://doi.org/10.6084/m9.figshare.7038758.v2>

Bejarano, A., Hoffmann, C. (2018). Topological Interlocking Cylinder Configurations: A Geometric Approach. In T. Siegmund & F. Barthelat (Eds.) Proceedings of the IUTAM Symposium Architected Materials Mechanics, September 17-19, 2018, Chicago, IL: Purdue University Libraries Scholarly Publishing Services, 2018.

<https://docs.lib.purdue.edu/iutam/presentations/abstracts/9>

2013 **Bejarano, A.,** Morales, G. (2013). Solving real problems supported by corporative IT tools: A New Strategy of Professional Experience from the Classroom. World Engineering Education Forum WEEF 2013, Cartagena, Colombia.

<https://acofipapers.org/index.php/acofipapers/2013/paper/viewFile/314/166>

Bejarano, A., Morales, G., Rodriguez, M., Wightman, P. (2013). Strategies for Professional Skill Development through the Strengthening of Student Groups: A Case of Study. World Engineering Education Forum WEEF 2013, Cartagena, Colombia.

<https://acofipapers.org/index.php/acofipapers/2013/paper/viewFile/313/165>

In Preparation and Under Review Publications

2021 **Bejarano, A.,** Hoffmann, C. (2021) Multistep mid—section evolution method to generate topological interlocking assemblies. (Peer-reviewed journal. Under review)

Bejarano, A., Hoffmann, C. (2021) On the Generation of Topological Interlocking Configurations Based on Free-Form Geometric Domains. (Peer-reviewed journal. In preparation)

Conference Presentations and Selected Talks

2020 **Bejarano, A.,** Hoffmann, C., (2020). TIGER: Topological Interlocking GEnerator. In IEEE GMAX 2020, September 17-18, Universidad del Norte, Barranquilla, Colombia. (Presentation)

Wightman, P., Salazar, A., **Bejarano, A.** (2020). IEEE 2020 Technology Trends. In Department of Systems Engineering and Computation, May 13, Universidad del Norte. (Presentation)

Bejarano, A., (2020). Generation of Topological Interlocking Configurations from a Geometric Approach. In CGVLAB Lunch Talk, April 15, Purdue University. (Presentation)

2019 **Bejarano, A.,** (2019). Equilibrium of Compression-Only Structures Made of Convex Polyhedra. In CGVLAB Lunch Talk, September 11, Purdue University. (Presentation)

Bejarano, A., (2019). Dealing with Shape, Simulation and Equilibrium of Convex Interlocking Assemblies. In CGVLAB Lunch Talk, February 5, Purdue University. (Presentation)

2018 **Bejarano, A.,** Hoffmann, C., (2018). Topological Interlocking Cylinder Configurations: A Geometric Approach. In IUTAM 2018 Symposium of Architected Materials Mechanics. Chicago, IL. (Poster)

Bejarano, A., (2018). Topological Interlocking Cylinder Configurations: A Geometric Approach. In CGVLAB Lunch Talk, September 18, Purdue University. (Presentation)

Bejarano, A., (2018). Convex Interlocking Generation Based on Polyhedron Midsection Evolution. In CGVLAB Lunch Talk, April 17, Purdue University. (Presentation)

2017 **Bejarano, A.,** (2017). Challenges on the Construction of Topological Interlocking Configurations on Solids and Meshes. In CGVLAB Lunch Talk, September 19, Purdue University. (Presentation)

- Bejarano, A.**, (2017). Topological Interlocking: Life Beyond the Plane. In CGVLAB Lunch Talk, February 8, Purdue University. (Presentation)
- 2016 **Bejarano, A.**, (2016). A Glimpse of Topological Interlocking Configurations. In CGVLAB Lunch Talk, September 21, Purdue University. (Presentation)
- Bejarano, A.**, (2016). Assemblable Interlocking Polyominoes. In CGVLAB Lunch Talk, April 13, Purdue University. (Presentation)
- 2013 **Bejarano, A.**, Morales, G. (2013). Solving real problems supported by corporative IT tools: A new strategy of professional experience from the classroom. In Teaching Innovation International Forum, Innova CESAL Network, October 8-10, Bogota, Colombia. (Presentation)
- Bejarano, A.** (2013). Experiences, Results and Expectations from the Systems Engineering Computer Graphics Student Group at Uninorte. In Bogota SIGGRAPH 2013. Bogota, Colombia. (Presentation)
- Bejarano, A.**, Morales, G. (2013). Solving real problems supported by corporative IT tools: A new strategy of professional experience from the classroom. In World Engineering Education Forum WEEF 2013, September 25-26, Cartagena, Colombia. (Poster)
- Bejarano, A.**, Morales, G., Rodríguez, M., Wightman, P. (2013). Strategies for Professional Skill Development Through the Strengthening of Student Groups: A Case of Study. In World Engineering Education Forum WEEF 2013, September 25-26, Cartagena, Colombia. (Presentation)
- 2012 **Bejarano, A.**, Gomez, A., Guzman, L., Habib, S., Londono, O., Rondon, A. (2012). Implementation of a Basic Flight Simulator Controlled by Computational Vision. In Bogota SIGGRAPH 2012. Bogota, Colombia. (Poster)

Research Projects

- July 2016
To Present **Generation of Topological Interlocking Configurations from a Geometric Approach**
Department of Computer Science, Purdue University, West Lafayette, Indiana, USA
Doctoral thesis research advised by Dr. Christoph Hoffmann. Pioneered parametric generation methods for Topological Interlocking Configurations based on free-form geometric domains. Results published in the *International Journal of Architectural Computing, IUTAM 2018*, and *IEEE GMAX 2020*.
- August 2017
To May 2020 **Creating a Digital Environment for Enabling Data-Driven Science (DEEDS)**
Rosen Center for Advanced Computing, Purdue University, West Lafayette, Indiana, USA
Designed and proposed components to support representation and analysis of multi-dimensional hierarchical data from multi-disciplinary research projects. Results published in *Future Generation Computer Systems, Computing in Science & Engineering*, and *Gateways 2018*.
- May 2017
To August 2017 **NIPTE-FDA Excipients Risk Analysis Tool**
Rosen Center for Advanced Computing, Purdue University, West Lafayette, Indiana, USA
Consolidated a platform for risk assessment evaluation during drug manufacturing based on excipients, dosage forms, functionalities, manufacturing methods, and grades. Results published in *AAPS PharmSciTech*.
- May 2017
To May 2017 **Building a Modular Cyber-Platform for Systematic Collection, Curation, and Preservation of Large Engineering and Science Data**
Rosen Center for Advanced Computing, Purdue University, West Lafayette, Indiana, USA

Architected scalable systems to support and improve sharing files and data visualization of large, classified datasets from science and engineering disciplines. Results published in *Computing in Science & Engineering*.

January 2015 **Assemblable Interlocking Polyominoes**

To July 2016 *Department of Computer Science, Purdue University, West Lafayette, Indiana, USA*

Explored the interlocking properties of assemblable polyominoes and their usage to represent monotonic Boolean expressions.

March 2014 **Low-Cost Smart-Home Environments Based on Embedded Systems**

To February 2015 *Department of Systems Engineering and Computation, Universidad del Norte, Barranquilla, Col.*

Classified the trends from proposed smart home environments to formulate a scalable, low-cost system for indoor domotic environments. Results published in *International Journal of Automation and Smart Technology*.

July 2010 **NORIA: Node Reservation Intelligent Agent**

To November 2012 *Department of Systems Engineering and Computation, Universidad del Norte, Barranquilla, Col.*

Master's thesis research advised by Dr. Jose Marquez. Formulated a node reservation protocol for ad-hoc wireless networks to prioritize routing and establish exclusive communication paths between nodes.

January 2008 **Detection of Source Code Similitude in Academic Environments**

To December 2008 *Department of Systems Engineering and Computation, Universidad del Norte, Barranquilla, Col.*

Senior final project advised by Dr. Lucy Garcia. Explored the problem of code plagiarism in freshman programming courses and proposed a system to detect similar code and rank the similarities. Results published in *Computer Applications in Engineering Education*.

Teaching Experience

Fall 2020 **Instructor: CS251 – Data Structures and Algorithms**

Spring 2021 *Department of Computer Science, Purdue University, West Lafayette, Indiana, USA*

Summer 2021 628 students in total. Co-managed 50 Teaching Assistants in total. Lectured, oversaw students' progress, and designed evaluation activities.

Summer 2021 **Instructor: CS182 – Fundamentals of Computer Science**

Department of Computer Science, Purdue University, West Lafayette, Indiana, USA

80 students. Co-managed 6 Teaching Assistants. Lectured, oversaw students' progress, and designed evaluation activities.

Spring 2016 **Graduate Teaching Assistant: CS251 – Data Structures and Algorithms**

Summer 2015 *Department of Computer Science, Purdue University, West Lafayette, Indiana, USA*

Spring 2015 113 students in total. Oversaw students' progress and designed evaluation activities.

Fall 2014

Fall 2015 **Graduate Teaching Assistant: CS334 – Fundamentals of Computer Graphics**

Department of Computer Science, Purdue University, West Lafayette, Indiana, USA

40 students. Oversaw final group projects and designed evaluation activities.

Spring 2014 **Instructor: ELP8510 – Mobile App Programming**

Fall 2013 *Department of Systems Engineering and Computation, Universidad del Norte, Barranquilla, Col.*

Spring 2013 85 students in total. Developed the entire curriculum, lectured, designed evaluation activities,

Fall 2012 and oversaw final group projects.

- Spring 2014 **Instructor: IST2121 – Multimedia for Communications**
 Spring 2013 *Department of Systems Engineering and Computation, Universidad del Norte, Barranquilla, Col.*
 Fall 2012 111 students in total. Developed the entire curriculum, lectured, designed evaluation activities.
 Spring 2012
- Spring 2013 **Instructor: IST2121 – Fundamentals of Computer Graphics**
 Fall 2012 *Department of Systems Engineering and Computation, Universidad del Norte, Barranquilla, Col.*
 20 students in total. Developed the entire curriculum, lectured, designed evaluation activities, and oversaw final group projects.
- Fall 2013 **Instructor: IST2088 – Algorithms and Programming I**
 Spring 2011 *Department of Systems Engineering and Computation, Universidad del Norte, Barranquilla, Col.*
 Fall 2010 90 students in total. Lectured, designed evaluation activities, and oversaw final group projects.

Honors and Awards

- 2016 **Raymond Boyce Graduate Teacher Award**
Department of Computer Science, Purdue University, West Lafayette, Indiana, USA
- 2013 **Diploma in University Pedagogy**
Center of Instructional Excellence (CEDU), Universidad del Norte, Barranquilla, Colombia
- 2012 **Graduate Scientific Merit, Finalist**
School of Engineering, Universidad del Norte, Barranquilla, Colombia
- 2020 Reviewer, IEEE Games, Animation, Multimedia, and Multiple Realities – IEEE GMAX 2020
- 2012 To 2013 Host, Computer Graphics Workshop, Universidad del Norte, Barranquilla, Colombia
- 2006 To 2009 Member, CCEIS student group, Universidad del Norte, Barranquilla, Colombia

Student Advising and Mentoring

- 2021 **Pratheek Voona**
Department of Computer Science, Purdue University, West Lafayette, Indiana, USA
 Mentoring Pratheek on fundamentals of computer graphics and animations for his second-year computer science independent studies.
- 2020 **Aniket Gupta**
Department of Computer Science, Purdue University, West Lafayette, Indiana, USA
 Mentored Aniket on fundamental concepts and practical applications of machine learning and deep learning for his second-year computer science independent studies.
- 2013 **Oscar Londoño, Alejandro Rondon**
Department of Systems Engineering and Computation, Universidad del Norte, Barranquilla, Col.
 Advised Oscar and Alejandro on their final senior project about designing natural user interfaces based on color tracking using low-cost cameras. Students were finalists for the Undergraduate Scientific Merit Award 2014.
- Jose Gonzalez**
Department of Systems Engineering and Computation, Universidad del Norte, Barranquilla, Col.
 Advised Jose on his final senior project about “Tambora Hero,” a rhythmic videogame based on gesture recognition using Kinect, inspired by a relevant local music instrument.

Elba Sanchez, Juan Henao

Department of Systems Engineering and Computation, Universidad del Norte, Barranquilla, Col.
Co-advised Elba and Juan on their final senior project about performance analysis on the NORIA reservation model for ad-hoc wireless networks.

Hector Villa, Rodolfo Pineda

Department of Systems Engineering and Computation, Universidad del Norte, Barranquilla, Col.
Co-advised Hector and Rodolfo on their final senior project about "Maximum Consequentia," a videogame designed to complement reading comprehension instructional activities.

Cinthya Reatiga, Laura Llach

Department of Systems Engineering and Computation, Universidad del Norte, Barranquilla, Col.
Co-advised Cinthya and Laura on their final senior project about supplemental localization information based on local color recognition using Lego Mindstorm.

2012 to 2014

Computer Graphics and Mobile App Development Student Groups

Universidad del Norte, Barranquilla, Col.

Mentored undergrad students on the development of interactive software and mobile apps as an extracurricular activity. Encouraged students to build initial professional portfolios.

Interests

Hiking, math history, instrumental music, photography.