Johann J. **Cardenas**

MS IN CIVIL ENGINEERING · PHD STUDENT

(+1) 217-953-1311 | johannc2@illinois.edu | https://johann-cardenas.github.io/ | Johann-Cardenas | /in/johanncardenas/

Summary

PhD student in Civil Engineering and Research Assistant at the Illinois Center for Transportation. Specializes in computational mechanics, with a focus on finite element modeling and numerical methods to advance highway and airfield pavement design. Experience across IDOT and FAA research projects, plus industry work including planning, design, construction, maintenance, and operations of road networks.

Education

University of Illinois, Urbana-Champaign — *Illinois, USA*

Doctor of Philosophy in Civil Engineering, Ph.D. — *May. 2023 - May. 2027*

- Research emphasis on computational mechanics and data analytics for pavement design and evaluation | GPA: 3.97

University of Illinois, Urbana-Champaign — *Illinois, USA*

Master of Science in Civil Engineering, M.S. — *Aug. 2021 - May. 2023*

- Fulbright Foreign Scholar selected among top-tier professionals | GPA: 4.00

National University of San Marcos (UNMSM) — *Lima, Peru*

Bachelor of Science in Civil Engineering, B.S. — *Mar. 2011 - Jul. 2016*

- Graduated ranked #1 out of 39 students in cohort

Profesional Development

University of Engineering and Technology (UTEC) — *Lima, Peru*

Specialization Program in Pavement Engineering — *Nov. 2020 - Jul. 2021*

- Received the Academic Excellence Award for graduating top of class | GPA: 19.0/20.0
- Completed advanced coursework in pavement materials characterization, mechanistic-empirical design, and asset management

ESAN Graduate School of Business — *Lima, Peru*

International Diploma in Project Management — *Feb. 2020 - Set. 2020*

- Graduated #1 out of 62 students (1/62) | GPA: 17.6/20.0
- Gained strong cross-functional leadership and planning skills applicable to engineering projects execution

Skills

Coursework	CEE 407 Airport Design, CEE 506 Pavement Design II, CEE 416 Traffic Capacity Analysis, CEE 598 Advanced Bituminous Materials, CEE 508 Pavement Evaluation and Rehabilitation, CEE 570 Finite Element Methods, CS 547 Deep Learning
Software	ABAQUS, AutoCAD, Civil 3D, Power BI, Primavera P6, MS Project, SAP2000, ETABS
Programming	Python, Matlab, R, HTML, CSS, JavaScript, Java and LaTeX
Languages	Spanish (Native), English (Proficient), Portuguese (Basic)

Research Experience

Illinois Center for Transportation (ICT) — *Illinois, USA*

Graduate Research Assistant — *Aug. 2021 - Present*

- Developed a mechanistic framework to integrate emerging loading conditions into highway flexible pavement design.
- Conducted numerical simulations to predict the response of airfield flexible pavement structures using advanced FEM Modeling.
- Analyzed the influence of tire geometry, load, inflation pressure and rolling condition on contact stresses through parametric modeling
- Performed laboratory testing to characterize asphalt mix behavior, including Dynamic Modulus measurements.
- Led documentation, progress tracking, and team coordination for the following research projects:

  Impact of Commercial Electric Vehicles on Flexible Pavement Performance — *Aug. 2022 - Mar. 2025*

  Building Machine-learning-based Prediction Models for Computationally Efficient Airfield Pavement Analysis — *Aug. 2021 - Jun. 2024*

Technical Reports

Illinois Center for Transportation (ICT)

University of Illinois, Urbana-Champaign

- **Jayme A., Hernandez J., Al-Qadi I., Cardenas J., Hafeez M., and Villamil W. (2025)** Impact of Heavy Commercial Electric Vehicles on Flexible Pavements. *ICT Project R27-252*. Illinois Center for Transportation. *ISSN:0197-9191*. `https://doi.org/10.36501/0197-9191/25-003`.
- **Jayme, A., Zhou, Q., Cardenas J., Liu, F., Singh, A. and Al-Qadi I. (2024)** Building Machine-learning-based Prediction Models for Computationally Efficient Airfield Pavement Analysis. Volume II. *ICT-R27-246*. Illinois Center for Transportation. Accepted **[Under Review]**.

Journal Articles

- **Hafeez M., Al-Qadi I., Cardenas J., Jayme, A. and Hernandez, J. (2026)** Electric Truck Adoption: Infrastructure Energy Burden and Economic Impacts. *ASCE Journal of Transportation Engineering: Part B, Pavements*. Accepted **[Under Review]**.
- **Cardenas J., Jayme, A., Hernandez, J. and Al-Qadi I. (2026)** Quantification of Truck Electrification Damage to Flexible Pavements. *Transportation Research Record*. Accepted **[Under Review]**.
- **Jayme, A., Cardenas J., Hernandez, J. and Al-Qadi I. (2026)** Relative Flexible Pavement Distress due to Heavy-Duty Electric Trucks. *Transportation Research Record*, *0*(0) `https://doi.org/10.1177/03611981251404350`
- **Cardenas J., Jayme, A., Hernandez J., and Al-Qadi I. (2025)** Flexible Pavement Damage Quantification for Heavy-Duty Electric Trucks. *ASCE Proceedings of the International Airfield and Highway Pavements Conference 2025: Design, Construction, Condition Evaluation, and Management of Pavements*. `https://doi.org/10.1061/9780784486214.059`
- **Singh, A., Khan, A., Cardenas J.,and Al-Qadi I. (2025)** Effect of Road Roughness on E-Truck Energy Consumption. *International Journal of Pavement Engineering*, *151*(1) `https://doi.org/10.1080/10298436.2025.2528982`
- **Cardenas J., and Al-Qadi I. (2024)** Impact of Road Roughness on Tire-Pavement Contact Stresses During Vehicle Maneuvering. *ASCE Journal of Engineering Mechanics*, *151*(2). `https://doi.org/10.1061/JENMDT.EMENG-7900`
- **Hernandez J., Jayme, A., Cardenas J., and Al-Qadi I. (2024)** Effect of Heavy-Duty Electric Vehicles on Tire-Pavement Contact Forces. *ASCE Journal of Engineering Mechanics*, *151*(1). `https://doi.org/10.1061/JENMDT.EMENG-7835`
- **Cardenas J., and Al-Qadi I. (2024)** Impact of Dynamic Wheel Loading on Flexible Pavement Responses for Non-Free Rolling Conditions. *Transportation Research Record*, *2678*(11) `https://doi.org/10.1177/03611981241242378`

Honors & Awards

2025	**Recipient**, ACRP Graduate Research Award Program on Public-Sector Aviation Issues	*DC, USA*
2025	**Recipient**, Illinois Asphalt Pavement Association (IAPA) Scholarship	*Illinois, USA*
2025	**Audience Choice Award**, Transportation Research Board: Three-Minute Thesis Competition	*DC, USA*
2024	**Recipient**, San Diego Supercomputer Center's CIML Summer Institute 2024 Scholarship	*California, USA*
2024	**3rd Place**, Ashby Prize in Computational Science, National Center for Supercomputing Applications	*Illinois, USA*
2021	**Grantee**, Fulbright Foreign Student Scholarship	*Lima, PERU*
2021	**Recipient**, UTEC Academic Excellence Certificate	*Lima, PERU*
2020	**Grantee**, UTEC Pavement Engineering Scholarship	*Lima, PERU*
2020	**Recipient**, ESAN Academic Excellence Certificate	*Lima, PERU*
2016	**Recipient**, UNMSM Academic Excellence Certificate	*Lima, PERU*

Industry Experience

CONCAR S.A - Grupo Graña y Montero

Lima, Peru

Project Engineer | Project Control — *Jan. 2019 - Mar. 2021*

- Project Type: Road Construction, Management & Operation
- Managed formulation, approval and execution of additional work with the client.
- Issued monthly project operational and performance reports. Elaborated annual budget plan and annual planning dossier.
- Selected, hired, monitored and dealt with subcontractors and suppliers.

FLESAN DEL PERU S.A.C

Lima, Peru

Junior Engineer | Project Control — *Jul. 2018 - Dec. 2018*

- Project Type: Foundations and Anchored Walls Construction for a Retail Store.
- Reviewed engineering drawings and issued requests for information reports (RFI's) to the Project Management Office.
- Formulated project additional and deductive budgets. Issued weekly progress reports ("S" Curve) to the client.

CONCAR S.A. - Grupo Graña y Montero

Apurimac, Peru

Junior Engineer | Project Control — *Aug. 2017 - Jun. 2018*

- Project Type: Management and Conservation by Service Levels of a Road Corridor
- Controlled and monitored productivity rates. Reported daily project cost status to the Project Manager.
- Elaborated progress reports ("S" Curve) and aggregate cost reports.
- Generated and issued project services orders to subcontractors and suppliers.

CONCAR S.A. - Grupo Graña y Montero

Apurimac, Peru

Trainee Engineer | Talent Development Program — *Jan. 2017 - Jul. 2017*

- Project Type: Management and Conservation by Service Levels of a Road Corridor
- Processed field-collected productivity data and kept track of planning schedule. Controlled productivity rates.
- Generated and issued project service orders to subcontractors and suppliers.
- Identified bottlenecks in the road construction process. Prepared and proposed a solution to the Top Management as the final deliverable of the program. Shortly after, I was invited to join the company.