Irving R. Barron Martinez

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Current Position

Assistant Professor of Instruction *Jul. 2024-Present*
University of Rochester, Rochester, New York

- Department of Electrical and Copmputer Engineering

Education

Ph.D. in Electrical & Computer Engineering *2024*
University of Rochester, Rochester, New York

M.S. in Electrical & Computer Engineering *2018*
University of Rochester, Rochester, New York

M.S. in Electronic Engineering with Specialization in Digital Signal Processing *2015*
Universidad Autónoma de San Luis Potosí, San Luis Potosí, Mexico

B.S. in Electronic Engineering *2013*
Universidad Autónoma de San Luis Potosí, San Luis Potosí, Mexico

Teaching Experience

Instructor: ECE 487 Strategic Entrepreneurship & Innovation for Engineers *Fall 2025*
University of Rochester, Rochester, New York

- Graduate-level course
- Co-developed and Co-teach along with Professor Roberto Colangelo

Instructor: ECE 349 Design Capstone *Spring 2025, 2026*
University of Rochester, Rochester, New York

- Undergraduate-level course for seniors
- Co-teach along Dr. Jack Mottley and Daniel Phinney

Instructor: ECE 245/445 Wireless Communications *Spring 2025, 2026*
University of Rochester, Rochester, New York

- Undergraduate/graduate-level course

Instructor: ECE 348 Design Seminar *Fall 2024, 2025*

University of Rochester, Rochester, New York

- Undergraduate-level course for seniors
- Co-teach along Dr. Jack Mottley and Daniel Phinney

Instructor: ECE 241 Signals *Fall 2024, 2025*

University of Rochester, Rochester, New York

- Undergraduate-level course

Adjunct Professor: Programming *Spring 2016*

Universidad Autónoma de San Luis Potosí, San Luis Potosí, Mexico

- Undergraduate-level course
  - Covered fundamentals of the C++ programming language
- Conducted lectures, developed and graded assignments/exams

Substitute Professor: Linear Algebra *Fall 2015*

Universidad Autónoma de San Luis Potosí, San Luis Potosí, Mexico

- Undergraduate-level course
- Conducted lectures and graded assignments/exams
  - Covered the last quarter of the semester for the absent primary faculty member

Funding

I-Corps: Translation Potential of Enhanced Barcode Technologies *11/2024-10/2026*

$50,000

- National Science Foundation
- PI: Gaurav Sharma, Co-PI: Irving Barron

Student Course Development Project (SCDP): ECE 241 Signals *Summer 2025*

$3,960

- University of Rochester Teaching Center
- Hired undergraduate student to develop course content, learning materials, and learning activities
- Six weeks of full-time summer work for course development

Affiliations/Service

Affiliations

IEEE, Member *2024-Present*

IEEE, Graduate Student Member *2021-2024*

University Service

Chief Technology Advisor at the Ain Center for Entrepreneurship and Innovation *2025-Present*
University of Rochester, Rochester, New York

Member at the ECE Department Undergraduate Committee *2024-Present*
University of Rochester, Rochester, New York

Member at the ECE Department Engagement and Enrichment Committee *2024-Present*
University of Rochester, Rochester, New York

Presentations

I. R. Barron "Dual modulated QR codes: augmented QR codes for carrying a secondary message enabling new applications," talk at *University of Rochester: Graduate Research Day*, Rochester, New York, 20 Oct. 2023.

I. R. Barron and G. Sharma, "Proximally secure communication in public settings using specialized barcodes," talk at *IS&T Electronic Imaging: Media Watermarking, Security, and Forensics*, Online, 28 Jan. 2021.

I. R. Barron and G. Sharma, "Toward CanvasChain: A block chain and craquelure hash based system for authenticating and tracking fine art paintings," talk at *IS&T Electronic Imaging: Media Watermarking, Security, and Forensics*, San Francisco, California, 29 Jan. 2020.

Publications

Peer-Reviewed Journal Papers

I. R. Barron and G. Sharma, "Optimized modulation and coding for dual modulated QR codes," *IEEE Trans. Image Process.*, vol. 32, pp. 2800–2810, 2023.

I. R. Barron, H. S. Yeh, K. Dinesh, and G. Sharma, "Dual modulated QR codes for proximal privacy and security," *IEEE Trans. Image Process.*, vol. 30, pp. 657–669, 2021.

Conference Papers

I. R. Barron and G. Sharma, "Proximally secure communication in public settings using specialized barcodes," in *IS&T Electronic Imaging: Media Watermarking, Security, and Forensics*, 27 – 28 Jan. 2021, pp. 346.1–6.

I. R. Barron and G. Sharma, "Toward CanvasChain: A block chain and craquelure hash based system for authenticating and tracking fine art paintings," in *IS&T Electronic Imaging: Media Watermarking, Security, and Forensics*, San Francisco, California, 27 – 29 Jan. 2020, pp. 399.1–5.

Magazine Articles

I. R. Barron and G. Sharma, "Quashing quishing attacks using self-authenticating dual-modulated QR codes," in *IEEE Security & Privacy*, pp. 2–10, 2025, doi: 10.1109/MSEC.2025.3530487.

Media

"Solving the Problem of QR Codes," Allan Timothy *May 2025*
US National Science Foundation News
https://youtube.com/watch?v=rg4tI74CfMg

"QR Code Security," Nate Pottker *May 2025*
US National Science Foundation Discovery Files Podcast
https://www.youtube.com/watch?v=LC32y3YPqt8&list=PL0ujJTaPsv3cFZCgjHk-XdsD7JjY6wM0t

“New technology could quash QR code phishing attacks,” Luke Auburn *Feb. 2025*

Hajim School of Engineering & Applied Sciences, University of Rochester

https://www.rochester.edu/newscenter/qr-code-phishing-definition-quishing-638842/