

# Harshkumar Oza

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## EDUCATION

| Degree/Certificate | Institute/Board                       | CPI/Percentage | Year |
|--------------------|---------------------------------------|----------------|------|
| B.Tech.            | Indian Institute of Technology Indore | 8.77/10        | 2021 |
| JEE Training       | Resonance Eduventures Kota            | In top 0.7%    | 2017 |
| Higher Secondary   | GSHSEB (Gujarat)                      | 87.54%         | 2016 |
| Secondary          | GSHSEB (Gujarat)                      | 84.33%         | 2014 |

## AREAS OF INTEREST

- Antenna Design, Nanophotonics, Photonic Integrated Circuits, Quantum Computing

## PUBLICATION

- **Harshkumar Oza**, Maharana Pratap Singh, Saptarshi Ghosh, "A 38-GHz Substrate Integrated Waveguide Cavity-Backed Tapered-Slot Antenna", *Indian Conference on Antennas and Propagation (InCAP 2021)*. (13-16 December 2021)

## RESEARCH EXPERIENCE AND PROJECTS

- **Microwave and mm-wave antenna design using SIW technology** Dec. 2020 - June 2021  
*B.Tech. Project, Dr. Saptarshi Ghosh* Report
  - Designed an antenna at 38 GHz using Substrate Integrated Waveguide (SIW) technology on Rogers RT/Duroid 5880 substrate of thickness 0.254 mm.
  - The antenna achieves a bandwidth of 2.54 GHz (37.57 - 40.11 GHz) with a gain varying from 7.51 to 8.08 dBi over the entire bandwidth.
  - Used Ansys HFSS software to simulate and optimize the antenna geometry.
  - Created a tool in Desmos (an online graphing calculator) to do SIW geometry calculations.
  - Fabricated the antenna using the LPKF ProtoMat PCB prototyping machine.
- **Simulation of  $TM_{mn}$  modes of a Rectangular Waveguide** Nov. 2019  
*EE 305 (Electromagnetic Waves) Course Project, Dr. Saptarshi Ghosh* Project Link
  - We designed a MATLAB App to simulate and plot E and H vector fields for TM modes of a rectangular waveguide. Added animation panel to illustrate the flow of energy in the electric field.
- **LiFi based Audio Transmitter and Receiver** Aug. 2018  
*Personal Project* Project Link
  - Encoded audio signal intensity on white light transmitted through a high-power LED. Used a Solar Panel at the receiver end. Nullified the ambient light using a closed box.
  - Used a commercial audio amplifier for listening to the received audio signal.
- **Ground Station for receiving data from Public Weather Satellites** July 2018  
*Electronics Club, IIT Indore* Club Page
  - We built a Double Cross Antenna (DCA) to receive radio signals from the satellites.
  - Tracked NOAA-15, NOAA-18, NOAA-19, and METEOR-M2 public weather satellites.
  - Received APT signals from satellites using RTL-SDR and SDR-Radio.
  - Demodulated the signal, and decoded it using WxtoImg.
  - Successfully generated Grayscale and RGB images.

## PROFESSIONAL EXPERIENCE

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- **Larsen and Toubro Limited** *Aug. 2021 - Jan. 2022*  
*Graduate Engineer Trainee (GET)* Faridabad, India  
– Worked in Proposals and Contracts department of Railways Business Group.

## EXPERTISE

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- **Software/Tools:** Ansys HFSS, Origin Pro, MS Visio, LaTeX, Simulink, SDR Radio
- **Experimental:** LPKF ProtoMat PCB prototyping machine, Portable Vector Network Analyzer (VNA), 3D printer, RTL-SDR, Microcontroller
- **Computer Languages:** Python, MATLAB, C/C++
- **Utility:** Touch Typing (65-70 wpm), MS Word/Excel/PowerPoint

## ACADEMIC COURSES

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- **Mathematics:** Calculus, Linear Algebra and ODE-I, Complex Analysis and ODE-II, Numerical Methods, Mathematical Modeling and Simulation
- **Electronics Engineering:** Electromagnetic Waves, Antenna Theory, Quantum Mechanics, Solid State Electronic Devices, VLSI Systems and Technology, MOS Devices and Modeling, Communication Systems, Probability and Random Processes, Control Systems, Microprocessors, Network Theory, Power Electronics
- **Electives:** Finite Element Methods, Hybrid Electric Vehicles

## ONLINE COURSES AND CERTIFICATIONS

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- Introduction to Quantum Computing, Sponsored by IBM Quantum *Certificate*
- Understanding Research Methods, SOAS University of LONDON (Coursera) *Certificate*
- Using Python for Research, HarvardX, Harvard University (EdX) *Certificate*

## ACHIEVEMENTS

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- **Bronze Medal**, Terrace Farming Robot, Inter IIT Tech Meet 8.0 *Nov. 2019 - Dec. 2019*
- **3rd Place in Asia**, ASME Student Design Competition (SDC) 2018 *Dec. 2017 - Feb. 2018*
- **Gold Medal**, Circuit design hackathon, Intra IIT Tech Meet 2018, IIT Indore *Apr. 2018*
- **Merit-Cum-Means (MCM) Scholarship**, MHRD, Government of India *2017 - 2021*
- **In top 0.7%**, Among 2 million candidates in JEE 2017 *2017*

## POSITIONS OF RESPONSIBILITY

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- **Member**, Technical Council, IIT Indore *Apr. 2019 - Apr. 2020*
  - **Head**, Electronics and Automation Division, Team Robocon IIT Indore *Mar. 2018 - Mar. 2019*
  - **Team Leader**, Terrace Farming Robot, Inter IIT Tech Meet 8.0 *Nov. 2019 - Dec. 2019*
  - **Head**, Electronics and Coding Division, ASME SDC 2018 *Dec. 2017 - Feb. 2018*
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