

# Hatim Kanchwala

Pre-final Year • Undergraduate • Electrical Engineering • Indian Institute of Technology Patna

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## INTERESTS

Computer Organisation & Architecture • Embedded Systems Design • Adaptive Filters • Neural Networks

## EDUCATION

### INDIAN INSTITUTE OF TECHNOLOGY PATNA

B. Tech. in Electrical Engineering

📅 2014 — 2018

📍 Bihta (BR), India

CPI: 7.59 / 10.0 (upto 5<sup>th</sup> semester)

### DEOGIRI COLLEGE

Higher Secondary

📅 2011 — 2013

📍 Aurangabad (MH), India

### NATH VALLEY SCHOOL

Primary & Secondary

📅 2001 — 2011

📍 Aurangabad (MH), India

## SKILLS

### PROGRAMMING

C/C++ • Assembly • Verilog • JavaScript • Python • Java • Scala • Shell • HTML/CSS •  $\text{\LaTeX}$

### SOFTWARE

GNU/Linux • git/GitHub • MATLAB • Simulink • Xilinx ISE • Multisim • Synopsys • Pyxis • MPLAB IDE • Proteus • NumPy/SciPy • Eclipse IDE

### HARDWARE

Xilinx Spartan FPGA • PIC Microcontroller • TMS320 DSP Chip • Arduino • 8051 Microcontroller • Raspberry Pi • Teensy

### LANGUAGES

English • Hindi • Gujarati • Urdu • Marathi • Arabic

## EXPERIENCE

### AFICIONADO VENTURES • Backend Engineer

💡 Startup • 📅 FEB. 2016 — OCT. 2016 • 📍 Gurugram (HR), India

- Purchasing platform helping restaurants procure better quality produce from competitive collection of vendors.
- Designed reactive backend architecture - MeteorJS server, MongoDB database, Heroku/mLab web app hosting, and Cordova for cross-platform mobile apps.
- Implemented MVP-stage marketplace platform with bilingual search to look up products in English/Hinglish. Prototyped conversational UX via messaging bot.
- Started work on vendor inventory and restaurant demand prediction models.

### ENHANCE FLASHROM WITH FEATURES TO READ & WRITE MULTIPLE STATUS REGISTERS AND LOCK & UNLOCK MEMORY SPACE • Google Summer of Code 2016 student with Coreboot

💡 Open-source • 📅 FEB. 2016 — AUG. 2016 • 🌐 hatimak/flashrom

- Designed multiple status registers model to abstract chip diversities across manufacturers into single consistent interface.
- Developed routines to lock/unlock memory space governed by bits in status register(s), handle configuration bits, and automatically generate BP range table for some chips.
- Added functionality to access/lock OTP memory areas.
- Developed CLI to expose new infrastructure. Tested on physical GigaDevice SPI chips using Raspberry Pi (over SPI bus), and Teensy.

### WEAVE • Co-founder & Product Developer

💡 Startup • 📅 JUNE 2015 — DEC. 2015 • 📍 Patna (BR), India

- Implemented prototype in JavaScript to build NURBS model of user, using input features and weighted combination of precomputed basis models.
- Developed algorithm to emulate dynamics for clothes on NURBS model - users can try clothes virtually.
- Despite garnering client & investor interest, startup failed because product-market fit was not right.

## PROJECTS

### FPGA IMPLEMENTATION OF NLMS ADAPTIVE FILTERING ALGORITHM FOR SIGNAL ENHANCEMENT

💡 Research • 📅 FEB. 2017 — PRESENT • 🌐 hatimak/zephyr

Adviser: Dr Yatendra Kumar Singh

- Implementing Normalized Least Mean Squares (NLMS) adaptive filtering algorithm to extract desired audio from signal corrupted with additive autoregressive noise.
- Prototyping on Xilinx Spartan-3E FPGA in Verilog HDL, with focus towards optimised placing and routing.
- Investigating performance gain by FPGA over typical DSP chip (TMS320).

## COURSEWORK

### UNDERGRADUATE

Embedded Systems  
VLSI Design  
Digital Electronics &  
Microprocessors  
Semiconductor Devices & Circuits  
Analog Integrated Circuits  
Digital Signal Processing  
Control Systems  
Communication Systems  
Electromagnetic Theory  
Electronic Instrumentation  
Electrical Power Systems  
Electrical Machines  
Linear Algebra  
Probability & Random Processes  
Algorithms & Data Structures

### MOOC

The Hardware/Software Interface  
Machine Learning  
Game Theory  
Valuation: Risk & Return  
Valuation: Time Value of Money

## BIOMETRIC ATTENDANCE SYSTEM SUITABLE FOR ECONOMIC AND LOW-POWER LIMITED-CONNECTIVITY REMOTE DEPLOYMENT

📅 JAN. 2015 — OCT. 2015

- Developed code to interface 8051 (Atmel AT89S51) with fingerprint reader (R305) and GSM/GPRS module (SIM900A) over serial port via multiplexer.
- Developed human interface using 16×2 LCD and keypad.
- Post biometric authentication, attendance data is transmitted by SIM900A via SMS to server. Fingerprints stored locally only.
- Developed firmware in C and ASM. Microcontroller operations simulated in Proteus.

## MINI PROJECTS

### 8085 INSTRUCTION SET ARCHITECTURE PROTOTYPE ON FPGA WITH BASIC PIPELINING

📅 FEB. 2017 — PRESENT • 🌐 hatimak/marineford

Adviser: Dr Kailash Chandra Ray

- Implementing Intel 8085 microprocessor ISA on Xilinx Spartan-3E FPGA in Verilog HDL. Developing ASM testbenches to profile performance delta due to pipelining.

### IMPLEMENTATION OF VIOLA-JONES OBJECT DETECTION FRAMEWORK

📅 JAN. 2017 — PRESENT • 🌐 hatimak/vj-goggles

Adviser: Dr Mahesh H. Kolekar

- Implementing algorithm proposed in paper by P. Viola and M. Jones in MATLAB and on TMS320 DSP chip.

### FULL-CUSTOM DESIGN OF RING OSCILLATOR

📅 NOV. 2016 • 🌐 hatimak/ring-osc

Adviser: Dr Kailash Chandra Ray

- Designed core layout of ring oscillator using AMI05 (0.5 μm) CMOS Technology in Pyxis (Mentor Graphics), and verified output of back annotated simulation.

## POSITIONS

### COORDINATOR, STARTUP RELATIONS • Entrepreneurship Club, IIT Patna

📅 APR. 2016 — PRESENT

- Serving as on-campus mentor to early stage startups, helping them develop business plan, choose investor strategy, and network with advisers.
- Building connections with startups and investors with vision to form investor panel for on-campus startups.
- Delivered presentations as part of In-house Lecture series conducted by E-Club.

### TASK MANAGER, STARTUP RELATIONS • Entrepreneurship Club, IIT Patna

📅 APR. 2015 — APR. 2016

- Part of Organising Committee for E-Club's flagship annual event, E-Week. Organised guest talks, workshops and pitching event.

### VOLUNTEER, STARTUP RELATIONS • Entrepreneurship Club, IIT Patna

📅 AUG. 2014 — APR. 2015