

## Tanim Mohammed Taher

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**OBJECTIVE:** To obtain a Co-Op/Intern position in a progressive company so as to employ my electrical engineering knowledge and research skills creatively to make a significant positive impact in the Electrical Engineering field.

**EDUCATION:** **Illinois Institute of Technology (IIT), Chicago, IL** **Spring 2008-Spring 2012**

- PhD in Electrical Engineering.
- Specialization: Communications
- GPA: 3.88

**Illinois Institute of Technology, Chicago, IL** **Jan 2006-Dec 2007**

- Masters of Science in Electrical Engineering.
- GPA: 4.0

**Illinois Institute of Technology, Chicago, IL** **Jan 2003 - Dec 2005**

- Bachelor of Science in Electrical Engineering.
- GPA: 3.94
- Dean's List: 2003-05

**GCE Advanced Level Exams** (High school, *GPA: 4.0*); Dhaka, Bangladesh **June 2002**

**GCE Ordinary Level Exams** (*GPA: 4.0*); Dhaka, Bangladesh **Jan 2001**

### Relevant Courses:

Advanced Computer Networks, Wireless Communication Systems, Communication Systems Principles, Communication Systems Fundamentals, Communication Electronics, Digital Data Communications, Java and C Programming, Control Systems, Digital Signal Processing (DSP), Assembly Programming and Microcomputers basics, Power Electronics, Engineering Electronics, Digital Systems, Microcomputers and Microcontrollers Applications, Undergraduate Research in Digital Signal Processors.

### ACHIEVEMENT AWARDS:

**Research Assistantship**, WiNCom Lab, IIT **Aug 08-present**

**First Place, IIT Research Day 2010** (University wide Research competition), IIT **April 10**

**Motorola Fellowship Award** **Jan 08-May 08**  
This award covers graduate tuition and stipend for IIT.

**Aileen S Andrew Foundation Fellowship Award** **Jan 07-Dec 07**  
I was awarded the Aileen S Andrew Foundation Fellowship award for *outstanding Academic Achievement and Research Work*. This award is presented to only one graduate student in the ECE department at IIT each year, and it covers full graduate tuition and stipend.

### EXPERIENCE:

**Research Assistant** **Jan 06-Current**  
**Wireless Networking and Communications Research Center (WiNCom)**, IIT, Chicago.  
The goal of our research team is to study the utilization of the wireless spectrum in order to come up with schemes for optimal usage through dynamic spectrum access and cognitive radio, and to investigate sources of wireless interference with the goal of mitigating its effects on wireless data transmission.

**Spectrum Usage Study:** Currently I am analyzing data collected at WiNCom that shows the broadband wireless spectrum usage at Chicago for the last 3 years. I am developing algorithms to extract details usage statistics, wireless usage trends, and for signal identification through signature detection

**Cognitive Radio:** I designed and implemented a Cognitive Radio transceiver that mitigates interference due to Microwave Ovens (MWO). This mechanism lowers the Bit Error Ratio (BER) to essentially 0%. The control case (without the cognitive radio interference mitigation technique) has high BER (1%–11%) that varies with the amount of spectral overlap between the MWO and the data signal. The research has been published (#4) at the *IEEE Consumer Communications & Networking* conference 08

**Symbol Shaping:** I designed and experimentally implemented an advanced modified version of a Direct Spread Spectrum Spreading 802.11 Wi-Fi communications system. My system uses symbol shaping to improve the spectral efficiency of the signal. Thus, the requirement to filter the signal is minimized, which improves the system performance by lowering Inter-Symbol Interference (**publication #3**).

**Microwave Oven:** I developed an experimentally based model for the interference signal from a MWO.

## **Research Engineer, System Architecture Group**

**Summer 2010**

### **ARRIS**, Lisle, IL.

ARRIS is a big player in the Cable Industry where they manufacture equipment for cable providers like Comcast, Time & Warner and other big companies around the world. As a summer intern, I worked in a small team to develop efficient methods to equalize for channel distortion and mitigate interference in the upstream path of a DOCSIS hybrid fiber coaxial plant. I also filed a **patent** as the *primary* inventor of a system that makes the equalizer tolerant against burst errors.

### **Teaching Assistant**

**Jan 06-May 07**

Electrical and Computer Engineering Department, IIT, Chicago.

In Spring 07, I was a teaching assistant for a signals and systems course at IIT. In 2006, I was the TA for two lab courses – Control Systems Laboratory and Electronics-1 laboratory. I also graded homework for Circuits-1 and two Communications courses.

### **Undergraduate Student Research Thesis**

**Fall 05**

Illinois Institute of Technology, Chicago.

This research studied various kinds of Digital Filters and categorized them according to their efficiency and cost. As the major accomplishment, I designed and developed an elaborate tutorial software for simulating various kinds of digital filters, and studying quantization effects in detail. The open source software is designed to aid DSP students grasp critical concepts.

### **Hydrogen-Powered Hybrid Vehicle Design, Research Assistant**

**Sept 04–May 05**

Illinois Institute of Technology, Chicago.

This project is to hybridize an electric scooter. The goal is to design and implement a fully hybrid system that runs the scooter with a hydrogen fuel cell and lithium-ion batteries. *As an undergrad research assistant*, I designed and constructed a semi-hybrid power control circuit, which managed successfully to charge one set of batteries using a fuel cell, and run the scooter through another set of batteries simultaneously. The designed switching circuit efficiently used the two batteries sets *alternatively* as needed. The implemented design was tested and verified to work effectively. (**Publication #1**)

### **Monitor Program for a Motorola Computer**

**Spring 05**

Illinois Institute of Technology, Chicago.

Designed and coded a resident monitor program for a computer-based MC68000 processor. The assembly-coded program performed utility functions in memory like memory scans, read-write operations, memory-testing operations, etc. The program makes efficient use of the computer's resources as a result of the low level language used to program the processor.

### **Ionic particle Simulator**

**Spring 2003**

Illinois Institute of Technology

Designed and coded software to simulate ions at atomic scale based on Physics laws. Ions were displayed in a 3-dimensional Graphic User Interface (GUI) implemented using my own 3-D algorithm.

## **PUBLICATIONS:**

- 1) **"Analysis and Hardware Development of a Novel Prototype Hybrid PEM Fuel Cell Li-Ion Battery Scooter"** by Mohammad Saad Alam, Tanim Taher, Mohammad Khader, Abdul Lateef, Riza Kizilel, presented at IEEE EHV conference at Pune, India on Dec 06.
- 2) **"Characterization of an Unintentional Wi-Fi Interference Device – the Residential Microwave Oven"**, by Tanim M Taher, Ayham Z Albanna, Donald R Ucci, Joseph L LoCicero, presented at IEEE MILCOM conference at Washington D.C. on Oct 06.
- 3) **"Symbol Shaping for Barker Spread Wi-Fi Communications"**, by Tanim M Taher, Matthew J Misurac, Donald R Ucci, Joseph L LoCicero, presented at IEEE EIT conference at Chicago, May 07.
- 4) **"Microwave Oven Interference Mitigation"**, by Tanim M Taher, Matthew J Misurac, Joseph L LoCicero, Donald R Ucci, presented at IEEE CCNC 08 conference at Las Vegas, Jan 08.
- 5) **"Microwave Oven Signal Modeling"**, by Tanim M Taher, Matthew J Misurac, Joseph L LoCicero, Donald R Ucci, presented at IEEE WCNC 08 conference at Las Vegas, March 08.
- 6) Taher, T.M.; Rele, K.; Roberson, D.; , **"Development and Quantitative Analysis of an Adaptive Scheme for Bluetooth and Wi-Fi Co-Existence,"** Consumer Communications and Networking Conference, 2009. CCNC 2009. 6th IEEE , vol., no., pp.1-2, 10-13 Jan. 2009.
- 7) Rele, K.; Roberson, D.; Bingjian Zhang; Li Li; Ying Bing Yap; Taher, T.; Ucci, D.; Zdunek, K.; , **"A Two-Tiered Cognitive Radio System for Interference Identification in 2.4 GHz ISM Band,"** Consumer Communications and Networking Conference (CCNC), 2010 7th IEEE , vol., no., pp.1-5, 9-12 Jan. 2010.

- 8) Bacchus, R; Taher, T; Zdunek, K; Roberson, D; "**Spectrum Utilization Study in Support of Dynamic Spectrum Access for Public Safety**", presented at Dynamic Spectrum Access (Dyspan) 2010 conference, Singapore, April 2010.
- 9) Taher, T; Bacchus, R; Zdunek, K; Roberson, D; "**Long term Spectral Occupancy Findings in Chicago**", IEEE Dynamic Spectrum Access (Dyspan) conference, Aachen, Germany, May 2011.
- 10) Taher, T; Bacchus, R; Zdunek, K; Roberson, D; "**Dynamic Spectrum Access Opportunity for Public Safety in the Land Mobile Radio Bands**", accepted for publication at IEEE Crowncom conference, Osaka, Japan, June 2011.

**PATENT:** Tanim Taher, Ayham Al-Banna: Method and Apparatus to Improve the Performance of Equalizers in Burst Receivers Based on MER. Arris International, filed October 2010: US 12/916300, Arris Docket No. - 7236. Status: pending

**SKILLS:**

HARDWARE	SOFTWARE & PROGRAMMING
<ul style="list-style-type: none"> <li>• Microprocessor applications.</li> <li>• Signal generators, Oscilloscopes, Power Supplies.</li> <li>• DC converters, relays, power control and switching circuitry.</li> <li>• Digital data acquisition system for multiple parameter measurements.</li> <li>• Spectrum Analyzer (including GPIB programming).</li> <li>• COMBLOCK (Modular Communications equipment)</li> <li>• Universal Software Radio Peripheral (USRP)</li> </ul>	<ul style="list-style-type: none"> <li>• Operating Systems: Windows, Linux</li> <li>• Languages: Java, C++, Visual Basic, Visual Dbase, Motorola Assembly, MATLAB coding.</li> <li>• Applications: MATLAB, Simulink, Microsoft Office, PSpice, Power-World, Network Simulator 2.</li> </ul>

**REFERENCES:**

1. **Dennis Roberson**,  
Vice Provost for New Initiatives, Illinois Institute of Technology,  
Research Professor in Computer Science, IIT,  
Director of WinCom, IIT.  
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