

# Swadhin Pradhan

MACHINE LEARNING ENGINEER & DATA SCIENTIST

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## Education

### The University of Texas at Austin

Austin, Texas, USA

PH.D. IN COMPUTER SCIENCE

2014 - 2020

- Thesis: Battery-free Wireless Sensing and Beyond
- Advisor: Lili Qiu
- CGPA: 3.92/4.0

### Indian Institute of Technology Kharagpur

Kharagpur, WB, India

M.S. (BY RESEARCH) IN COMPUTER SCIENCE AND ENGINEERING

2012 - 2014

- Thesis: Improving Localization and Energy Efficiency of Smartphone Applications
- Advisor: Niloy Ganguly
- CGPA: 9.66/10.0

### Jadavpur University

Kolkata, WB, India

B.E. (HONORS) IN INFORMATION TECHNOLOGY

2007 - 2011

- University Gold Medal
- CGPA: 9.45/10.0

## Experience

### DEVELOPMENT

#### Data Science Infrastructure Group, Cisco Meraki

Austin, TX, USA

SOFTWARE ENGINEER

October 2020 - Present

- Building RAG + LLM-based chat-bot aka *Cisco AI Assistant* which calls internal APIs and search through internal documents
- Instrumental in developing Networks Like You feature at Meraki Dashboard which helps customers to better plan configurations
- Contributed to better indoor wireless localization and online change-point detection system *uEval* at Meraki
- Enabling data intelligence and platforms for developing a more informed strategy

#### Interra Systems India Pvt. Ltd.

Kolkata, WB, India

SOFTWARE ENGINEER

May 2011 - Jan. 2012

- Successfully built an XML parser for a data format converter named OVC
- Built a front-end and command parser of a Graphical User Interface (GUI) viewer tool named Mirus3G

#### Interra Systems India Pvt. Ltd.

Kolkata, WB, India

SOFTWARE ENGINEERING INTERN

June 2009 - Aug. 2009

- Developed a SWIG interface for Python for a suite of C++ IP Libraries
- Developed a C++ template library to support easier management of products

### RESEARCH

#### NEC Labs America, Mobile Communications + Networking Group

Princeton, NJ, USA

RESEARCH INTERN

May 2017 - Oct. 2017

- Built a prototype of mobile voice assistant for future smart homes
- Two internal patents are filed based on the work

#### NEC Labs America, Mobile Communications + Networking Group

Princeton, NJ, USA

RESEARCH INTERN

May 2016 - Oct. 2016

- Built a prototype of RFID based seamless retail checkout system
- Built a RFID based battery-free touch interface
- Presented finding in ACM MobiCom 2017 and a workshop and filed a patent

#### Hewlett-Packard Enterprise Labs, Mobility & Networking Group

Palo Alto, CA, USA

RESEARCH INTERN

May 2015 - Aug. 2015

- Built a mobile application to assess notification importance based on user engagement level
- Presented findings in IEEE InfoCom 2017 and filed a patent

# Publications

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## SELECTED CONFERENCE/JOURNAL PAPERS

### 1. Indoor Air Quality Dataset with Activities of Daily Living in Low to Middle-income Communities

P. KARMAKAR, **SWADHIN PRADHAN**, AND S. CHAKRABORTY

- The Thirty-Eighth Annual Conference on Neural Information Processing System, Vancouver, Canada

*NeurIPS 2024 (Datasets and Benchmarks Track)*

December 2024

### 2. Exploiting Air Quality Monitors to Perform Indoor Surveillance

P. KARMAKAR, **SWADHIN PRADHAN**, AND S. CHAKRABORTY

- The ACM International Conference on Mobile Human-Computer Interaction, September, 2024, Melbourne, Australia

*ACM MobileHCI (LBW)*

September 2024

### 3. Exploring Indoor Air Quality Dynamics in Developing Nations

P. KARMAKAR, **SWADHIN PRADHAN**, AND S. CHAKRABORTY

- ACM Journal on Computing and Sustainable Societies, September, 2024

*ACM Compass (also in ACM JCSS)*

July 2024

### 4. Continuous Multi-user Activity Tracking via Room-Scale mmWave Sensing

A. SEN, A. DAS, **SWADHIN PRADHAN**, AND S. CHAKRABORTY

- The ACM/IEEE International Conference on Information Processing in Sensor Networks, May, 2024

*ACM/IEEE IPSN*

May 2024

### 5. Rotation Sensing Using Passive RFID Tags

**SWADHIN PRADHAN**, S. LI, AND L. QIU

- Symposium on Theory, Algorithmic Foundations, & Protocol Design for Mobile Networks and Computing, July, 2021, Shanghai, China

*ACM MobiHoc*

July 2021

### 6. RTSense: Passive RFID based Temperature Sensing

**SWADHIN PRADHAN**, AND L. QIU

- The 18th ACM Conference on Embedded Networked Sensor Systems, November, 2020, Yokohama, Japan

*ACM SenSys*

Nov. 2020

### 7. Combating Replay Attacks Against Voice Assistants

**SWADHIN PRADHAN**, W. SUN, G. BAIG, AND L. QIU

- Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT) Journal Issue 3, September, 2019

*UBICOMP*

Sept. 2019

### 8. Smartphone-based Indoor Space Mapping

**SWADHIN PRADHAN**, G. BAIG, W. MAO, L. QIU, G. CHEN, AND B. YANG

- Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT) Journal Issue 2, June, 2018

*UBICOMP*

Oct. 2018

### 9. RIO: A Pervasive RFID-based Touch Gesture Interface

**SWADHIN PRADHAN**, E. CHAI, K. SUNDARESAN, L. QIU, M. A. KHOJASTEPOUR, AND S. RANGARAJAN

- The 23rd Annual International Conference on Mobile Computing and Networking (MobiCom), 2017, Snowbird, UT, USA

*MOBICOM*

Oct. 2017

### 10. Understanding and managing notifications

**SWADHIN PRADHAN**, L. QIU, A. PARATE, AND K.H. KIM

- The 36th IEEE International Conference on Computer Communications (INFOCOM), 2017, Atlanta, GA, USA

*INFOCOM*

May 2017

### 11. ActivPass: Your Daily Activity is Your Password

S.K. DANDAPAT, **SWADHIN PRADHAN**, R.R. CHOUDHURY, N. GANGULY, AND B. MITRA

- The 33rd Annual ACM Conference on Human Factors in Computing Systems (CHI), 2015, Seoul, Korea
- Extensively covered in popular technical press such as MIT Technology Review, Boston Globe, The Guardian, American Banker etc.

*CHI*

April 2015

### 12. (Stable) Virtual Landmarks: Spatial Dropbox to enhance Retail Experience

**SWADHIN PRADHAN**, A. BALASHANKAR, N. GANGULY, AND B. MITRA

- The 6th International Conference on COMMunication Systems & NETWORKS (COMSNETS), 2014, Bangalore, India

*COMSNETS*

Jan. 2014

## WORKSHOP PAPERS

### 13. Konark: A RFID based system for enhancing in-store shopping experience

**SWADHIN PRADHAN**, E. CHAI, K. SUNDARESAN, L. QIU, AND S. RANGARAJAN

- The 4th Workshop on Physical Analytics (WPA), 2017, Niagara Falls, NY, USA

*WPA, co-located with MobiSys*

June 2017

### 14. Sprinkler: Distributed content storage for just-in-time streaming

S.K. DANDAPAT, **SWADHIN PRADHAN**, N. GANGULY, AND R.R. CHOUDHURY

- The 2013 workshop on Cellular networks: operations, challenges, and future design (Cellnet), 2013, Taipei, Taiwan

*Cellnet, co-located with MobiSys*

June 2013

## Honors & Awards

2019	<b>Recipient</b> , UT Austin Graduate Continuing Fellowship	Austin, Tx, USA
2018	<b>Student Travel Grant Recipient</b> , ACM MobiCom 2018	New Delhi, India
2018	<b>Student Travel Grant Recipient</b> , SIGCHI (for attending ACM UbiComp 2018)	Singapore
2017	<b>Student Travel Grant Recipient</b> , IEEE INFOCOM 2017	Georgia, USA
2011	<b>University Gold Medal Recipient</b> , For ranking 1st in class of B.E. (IT) in Jadavpur University	WB, India
2007	<b>Ranked within top 0.5% (approx. 100,000 aspirants)</b> , State engineering entrance examination	WB, India
2005	<b>Gold Medal Recipient</b> , District Topper in Secondary Examination and ranked 39 in the state	WB, India

## Patents

- 1. Battery-free touch-aware user input using RFID tags** US Patent: 10,346,655  
E. CHAI, **SWADHIN PRADHAN**, S. RANGARAJAN, M. KHOJASTEPOUR, AND K. SUNDARESAN July 2019
  - Patent is filed with NEC Labs America
  - Proposes a design of battery-free touch interface using RFID tags
- 2. Mobile Device Notification Scheduling** WIPO Patent: WO/2017/131748  
**SWADHIN PRADHAN**, A. PARATE, K.H. KIM, AND J. COOK Aug. 2017
  - Patent is filed with HPE Labs
  - Proposes a system which schedules notifications in mobile devices intelligently

## Technical Skills

<b>Programming Languages</b>	Python, C, Java, C++, SQL
<b>Software Engineering Knowledge</b>	ETL, Data Visualization, REST APIs, CI/CD, MLOps and DevOps
<b>Cloud Technologies</b>	Snowflake, AWS S3 / Lambda / Glue / Redshift, Kubeflow, Terraform
<b>Tools used</b>	OpenCL, MATLAB, NS3, Scikit-learn, Doxygen, SWIG, Pajek, NS2, FFMpeg, Flex, Bison
<b>Deep Learning Frameworks</b>	TensorFlow, PyTorch, Keras
<b>Hardwares used</b>	Embedded Platforms (Arduino, Raspberry Pi, HummingBoard Pro, BeagleBone), Ettus USRP
<b>Others</b>	Android Programming, GTK Programming, Socket Programming

## Interesting Projects

- Capturing ECG using wrist-worn IMUs** UT Austin, USA  
GRADUATE RESEARCH PROJECT March 2016 - May 2016
  - Attempted to measure ECG exploiting the vibrations of IMUs embedded in wrist-worn wearables
- Predicting Sarcasm in Tweets** UT Austin, USA  
GRADUATE COURSE PROJECT March 2015 - May 2015
  - Attempted to measure the level of sarcasm present in tweets
- Automatic Facial Expression Detection using EEG headset** UT Austin, USA  
GRADUATE COURSE PROJECT Oct. 2014 - Dec. 2014
  - Designed a system to detect the facial expression using the MUSE EEG headset
- A Browser plug-in for Search Trail Suggestion** IIT Kharagpur, India  
YAHOO HACK U June 2013
  - Designed a prototype which provided users with different series of search trail suggestions
- Analysing the impact of group performance in Test Cricket** IIT Kharagpur, India  
GRADUATE COURSE PROJECT Feb. 2013 - April 2013
  - Designed a novel metric to measure the impact of performance from the cricinfo data of test matches
- Setting up Low Cost GSM Network** Jadavpur University, India  
UNDERGRADUATE THESIS PROJECT July 2010 - March 2011
  - Designed and implemented a prototype of multi-hop delay-tolerant cellular network in a Java based simulation
- C to Assembly Translator** Jadavpur University, India  
UNDERGRADUATE COURSE PROJECT May 2010 - July 2010
  - Designed and implemented a whole pipeline of compiler and assembler for a subset of C language