

# Adwait Dongare

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## EDUCATION

### **CARNEGIE MELLON UNIVERSITY** | PHD CANDIDATE IN ELECTRICAL AND COMPUTER ENGINEERING

Expected Dec 2019 | Department of Electrical and Computer Engineering | Pittsburgh, Pennsylvania

Advisor: Prof Anthony Rowe

### **INDIAN INSTITUTE OF TECHNOLOGY - BOMBAY** | BTECH IN ENGINEERING PHYSICS WITH MINOR IN ELECTRICAL ENGINEERING

August 2014 | Department of Physics | Mumbai, India • Cumulative CPI: 8.55 / 10.0

## AWARDS

### **HSU CHANG MEMORIAL FELLOWSHIP**

2016 - 2017 | Carnegie Mellon University

## INDUSTRY EXPERIENCE

### **APPLE** | SOFTWARE ENGINEERING INTERNSHIP

June 2015 – Aug 2015 | Cupertino, California

- Developed system firmware for the low-power co-processor in iOS and watchOS devices.

## RESEARCH EXPERIENCE

### **WISELAB, CARNEGIE MELLON UNIVERSITY** | PHD CANDIDATE

Aug 2014 – Present | Pittsburgh, Pennsylvania • Advisor: Prof Anthony Rowe

- Development of platforms and protocols for nanosecond accurate time synchronization in computers, networking infrastructure and embedded systems
- Architecture and deployment of the OpenChirp Low-Power Wide Area Network (LPWAN) for last-mile wireless connectivity to low-power devices
- Development of the Roseline networking stack for Linux and RTOSes, and hardware platforms that are aware of the quality-of-time (clock accuracy, stability and offsets) available to them.

### **EXPERIMENTAL HIGH-ENERGY PHYSICS LAB, IIT-BOMBAY** | UNDERGRADUATE RESEARCHER

July 2012 – May 2014 | Mumbai, India • Advisor: Prof Pradeep Sarin

- Analog electronic front-end design for high-energy particle detectors that use diamond pixels
- Electronic system implementation for a cosmic ray detector

### **PANDA, FORSCHUNGSZENTRUM JÜLICH** | UNDERGRADUATE SUMMER INTERNSHIP

May 2013 – July 2013 | Jülich, Germany

- Evaluation and calibration of the analog sensing front-end in a straw-tube particle detector

### **GEO600, MAX PLANCK INSTITUTE FOR GRAVITATIONAL PHYSICS** | UNDERGRADUATE SUMMER INTERNSHIP

May 2012 – July 2012 | Hannover, Germany

- Implementation of an active electronic suspension system for the GEO600 gravitational wave detector

## PUBLICATIONS

### **PULSAR: WIRELESS PROPAGATION-AWARE CLOCK SYNCHRONIZATION**

Dongare, A. • Lazik, P. • Rajagopal, N. • Rowe A.

(Planned to Appear) IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS), 2017 • Pittsburgh, Pennsylvania

We design and evaluate a wireless clock synchronization system called Pulsar that achieves better than 5 nanosecond accuracy using a combination of an ultra-wideband (UWB) radio and a chip-scale atomic clock (CSAC). We expect it to have direct applications in next-generation wireless systems that target high scalability.

## **OPENCHIRP: A LOW-POWER WIDE-AREA NETWORKING ARCHITECTURE** | WORKSHOP PAPER

Dongare, A. • Hesling, C. • Bhatia, K. • Balanuta, A. • Pereira, R. L. • Iannucci, B. • Rowe, A.

(Planned to Appear) IEEE International Workshop on Smart Edge Computing and Networking (SmartEdge), 2017 • Big Island, Hawaii

Describes the architecture of a Low-Power Wide Area Network (LPWAN) named OpenChirp and the early experience in deploying it around CMU and Pittsburgh.

## **TIMELINE: AN OPERATING SYSTEM ABSTRACTION FOR TIME-AWARE APPLICATIONS**

Anwar, F. • D'souza, S. • Symington, A. • Dongare, A. • Rajkumar, R. • Rowe, A. • Srivastava, M.

IEEE Real-Time Systems Symposium (RTSS), 2016 • Porto, Portugal

We introduce the Timeline abstraction to Linux to simplify device synchronization and development of real-time applications.

## LEADERSHIP

### **IIT BOMBAY RACING TEAM** | DESIGN ENGINEER

August 2012 – May 2014 | Mumbai, India

- Developed the Electronic Control Unit, Data Acquisition and Safety Electronics hardware for electric racing vehicles competing at Formula Student-UK, Silverstone
- Led a team of 7 through planning, development and testing of electronic systems

## TEACHING

### **CARNEGIE MELLON UNIVERSITY** | GRADUATE TEACHING ASSISTANT

- 18-549 Embedded System Design | Spring 2017 (In Progress)
- 18-349 Introduction to Embedded Systems | Fall 2016
- 18-549 Embedded System Design | Spring 2015

## COURSEWORK

- Advanced Operating Systems and Distributed Systems | Fall 2015
- Real-Time Embedded Systems | Fall 2015
- Computer Networks | Spring 2016
- Graduate Artificial Intelligence | Spring 2017 (In Progress)
- Introduction to Machine Learning | Spring 2015
- Linear Systems | Fall 2014
- Applied Stochastic Processes | Fall 2014

## SKILLS

### **PROGRAMMING**

Comfortable:

C • C++ • Python • Matlab • Shell

Familiar:

Assembly • Verilog • Java

### **SOFTWARE**

OS Kernels:

Linux • Android • FreeRTOS

Mobile Development:

Android

### **HARDWARE**

Circuit Design:

Eagle • Altium

Embedded Processors:

ARM • AVR