

# Tanuja Sawant

## Education

Aug'13-May'18 **B.E. (Hons.) Computer Science & M.Sc. (Hons.) Physics BITS Pilani, K. K. Birla Goa Campus, India CGPA: 7.93/10**

## Work Experience

- Jan'18-Present **Research Intern, Technology for Emerging Markets Group, Microsoft Research, India**  
*Designing for people with Vision Impairments* supervised by Dr. Manohar Swaminathan
- Developing an RPG video game with accessibility features for people with visual impairments using Unity
  - Prototyping and building novel 3D spatial audio interfaces for the vision impaired using HoloLens
  - Conducting user studies and experimental validation of built prototypes
- Aug'17-Dec'17 **HCI Intern, VIA HCI Group, Télécom ParisTech, Paris, France**  
*Tactibits: Tactile Modules for Touch Pattern Generation* supervised by Dr. Eric Lecolinet
- Built tactile modules that simulate social touch by pattern generation using ATtiny and Arduino
  - Constructed prototypes by using thermoelectric modules, vibration motors, h-bridges & shift registers
  - Designed a user experiment to research how the vibrotactile and thermal characteristics of the touch modality can serve to leverage emotions using Unity, I2C communication and Uduino plugin
- May'16-July'16 **Research Intern, Bhaskaracharya Institute of Space Applications and Geoinformatics, Gandhinagar, India**  
*Object-based Image Analysis & Change Detection* supervised by Dr. Manoj Pandya
- Developed a Python script for object-based classification and change detection of bitemporal satellite images using scikit-learn, SciPy, GDAL and matplotlib
  - Implemented and assessed accuracy of Random Forests, PCA, SVM, and Multivariate Alteration Detection
  - Achieved an accuracy of 97.7 % using Random Forest algorithm
- May'15-July'15 **Research Intern, Physics Department, Indian Institute of Science**  
*Experimental Setup of Optical Tweezers* supervised by Dr. Vasant Natarajan
- Constructed an inexpensive optical tweezers setup to trap and image polystyrene beads using class 3 IR laser
  - Reduced cost by 80 % by formulating efficient experimental setups using inverted microscopes & optical fibres

## Projects

- Mar'17-Apr'17 **Smart Poster - Android App with NFC, QR code & AR interface**  
*Project Supervisor: Mr. Sreejith, Dept. of Computer Science, BITS-Pilani, Goa*
- Developed an Android app that configures host website's redirection on scanning NFC tag/QR code
  - Devised interactive AR object pop-ups of company items to enhance product marketing using Unity3D
  - Designed a database and server to generate QR codes and track no. of website visitors using PHP & MySQL
- Jan'17-May'17 **Elements of Effective Design and User Experience**  
*Project Supervisor: Dr. Geetha B, Dept. of Humanities, BITS-Pilani, Goa*
- Explored application of effective design principles to improve product design by reviewing research articles
  - 3D modelled the heritage site-St. Jacinto Church (Goa) using Agisoft Photoscan as the Photogrammetry tool
- Aug'16-Dec'16 **Computational Neuroscience and Signal Processing**  
*Project Supervisor: Dr. Veeky Baths, Dept. of Biology, BITS-Pilani, Goa*
- Classified SSVEP signals from EEG data obtained from a subject observing various LED frequencies
  - Found that Frequency Domain Analysis performed better than Time Domain Analysis by 16 %

- Mar'16 **Synthesis and Study of Carbon and Graphene Quantum Dots (CQDs & GQDs)**
- Led a team of 3 members to synthesize quantum dots using hydrothermal treatment of bottom-up synthesis
  - Studied UV light properties of CQDs & GQDs using Spectrofluorometry and Cyclic Voltammetry
  - Awarded Best Poster Award at ThinkNano Symposium 2016, Indian Institute of Science
- Jan'16-May'16 **Astronomical Image Processing**
- Project Supervisor: Dr. Kinjal Banerjee, Dept. of Physics, BITS-Pilani, Goa*
- Captured, corrected and calibrated CCD images of celestial bodies using IRAF software
  - Determined astronomical magnitudes of point sources using aperture photometry and CCDs
- Nov'15-Jul'16 **Cooperative Spectrum Sensing in Cognitive Radio Networks**
- Project Supervisor: Miss Rajalekshmi Kishore, Dept. of Electrical and Electronics, BITS-Pilani, Goa*
- Developed an efficient hybrid of local sensing and cooperative spectrum sensing using Energy Detector
  - Increased performance by devising better secondary user selection algorithm for Bayesian Detector in MATLAB
  - Presented findings at the international conference-WiSPNET 2016, later published in IEEE explore
- Aug'15-Dec'15 **Construction of a Rotating Table to trace the Trajectory of a Particle**
- Project Supervisor: Dr. Toby Joseph, Dept. of Physics, BITS-Pilani, Goa*
- Built a motor driven rotating table for studying fictitious forces and tracing particle trajectories
  - Designed mechanics experiments & complied experimental results with calculations for coefficient of friction

## Publications / Poster Presentation

- March 2016 Kishore, R., Ramesha, C. K., Sawant, T., "Superior Selective Reporting Mechanism for Co-operative Spectrum Sensing in Cognitive Radio Networks", Wireless Communications Signal Processing and Networking Conference, IEEE, Chennai, March 2016.
- March 2016 Ramnath, S., Joseph, G., Sawant, T., "Carbon & Graphene Quantum Dots-Synthesis and Application", Think-Nano Symposium, Indian Institute of Science, Bangalore, March 2016. **Best Poster Award**

## Technical Skills

- Programming C, C++, JAVA, Python, MATLAB, C#, HTML/CSS, JavaScript, MySQL
- Software Unity, Adobe Photoshop, Android SDK, Adobe Illustrator, Agisoft Photoscan
- Prototyping Arduino, ATtiny84/85, Raspberry Pi

## Positions of Responsibility

- Aug'15-Aug'16 Mentored 15 multicultural college freshmen to achieve social, academic and personal success by conducting weekly in-person meetups as part of college's Peer Mentorship Program
- Aug'15-Aug'16 Co-founded College's Compering Club, hosted 4 events for 2000 people
- Jan'15-May'15 Teaching Assistant (TA) for the course *Computer Programming*

## Achievements & Awards

- March 2017 Among the top 15 of 100 candidates to be selected for scholarship to attend the Computational Data Sciences Conference 2017, Indian Institute of Science (IISc), Bangalore
- March 2017 Won the football tournament as a member of Women's Football in Spree, India's biggest inter-collegiate sports festival
- July 2016 Top 10 % among 500 applicants selected for the interdisciplinary Physics of Life 2016, Monsoon School held at National Centre for Biological Sciences (NCBS), Bangalore
- July 2013 Awarded the INSPIRE-SHE Scholarship, Department of Science and Technology, Government of India
- Top 0.43 % among 1200000 students appeared for IIT JEE, India's most competitive engineering entrance
  - Top 1 % among 1300000 students appeared in 12th Standard Examination of Maharashtra State Board