Technische Universität München | Arcisstraße 21 | 80333 München
Professur für Umweltsensorik und Modellierung

A. Jagadeesh Kumar
Briachstraße 2, Zi. Nu. A114
Weingarten-88250
Baden Württemburg
Deutschland
Email: jagadeesh.srmuniv@gmail.com

München, 13. Juni 2017

**Subject: Invitation letter for conducting Master's Thesis at TU Munich**

Dear Mr. Jagadeesh Kumar. A,

It is my pleasure to invite you to the **Electronic System for High Accuracy Green-house gas Measurement** at the **Technische Universität München** from 10th August to 31st January 2018 in order to carry out your Master's thesis in the area of **Urban Emission Estimates Using TDLAS**. The **Environmental Sensing and Modeling** will provide the required laboratory space and experimental infrastructure that will be required to carry out your thesis. Close collaboration and supervision support from the senior researcher from the Chair will also be provided.

The task of the Master thesis is to design the electronic system to make the TDLAS measurement system be portable. That is: a temperature controller to control the temperatures of the laser and the photodetector, a current signal generator to tune the laser wavelength, and a data acquisition to record the laser light signal.

We understand that your travel expenses to Munich, including all incidental expenses, your accommodation in Munich and health insurance will be borne by you.

With best regards,

Sign by supervisor

Jia Chen

Lijuan LAN

**Technische Universität München**
Fakultät für Elektrotechnik und Informationstechnik
Professur für Umweltsensorik und Modellierung

**Professorin Dr.-Ing. Jia Chen**
Theresienstr. 90
Rückgebäude N5
80333 München

Tel. +49 89 289 23350
Fax +49 89 289 23348

jia.chen@tum.de
www.esm.ei.tum.de
www.tum.de

Bayerische Landesbank
IBAN-Nr.:
DE10700500000000024866
BIC: BYLADEMM
Steuer-Nr.: 143/241/80037
USt-IdNr.: DE811193231

Hochschule Ravensburg-Weingarten
Technik | Wirtschaft | Sozialwesen

# IMMATRIKULATIONSBESCHEINIGUNG

**für das Wintersemester 2017/18**

| | |
|---|---|
| Herr | Jagadeesh Kumar Ashok Kumar |
| Matrikel-Nr. | 28807 |
| geboren am | 05.01.1994 |
| geboren in | Chennai/India |
| ist an der | Hochschule Ravensburg-Weingarten |
| im Studiengang | El. and Embedded Systems |
| im Status | Haupthörer |
| mit dem Abschlussziel | Master of Engineering (M.Eng.) |
| | ordnungsgemäß immatrikuliert und nicht beurlaubt. |
| Bescheinigungsdauer: | Wintersemester 2017/18 |
| Wintersemester | 01.09. - 29.02. |
| Sommersemester | 01.03. - 31.08. |
| Regelstudienzeit: | 3 |

Erstellt am 06.11.2017

Diese Bescheinigung wurde per Computer erstellt und ist ohne Unterschrift gültig. Zusätze und Änderungen bedürfen der ausdrücklichen Bestätigung durch die Studentische Abteilung.

Verifikationsschlüssel: UGXKHXFNKPYL

Zur Verifikation dieser Bescheinigung rufen Sie bitte folgende Webadresse auf:
https://www.lsf.hs-weingarten.de/verify

Hochschule
Ravensburg-Weingarten -
Technik, Wirtschaft,
Sozialwesen
Doggenriedstrasse
88250 Weingarten

Herrn
Jagadeesh Kumar Ashok Kumar

Briachstraße 2, Zi. A114
88250 Weingarten

geboren am: 05.01.1994
in: Chennai/India
Matrikelnummer: 28807
aktuelles Fachsemester: 3

Montag, 06. November 2017

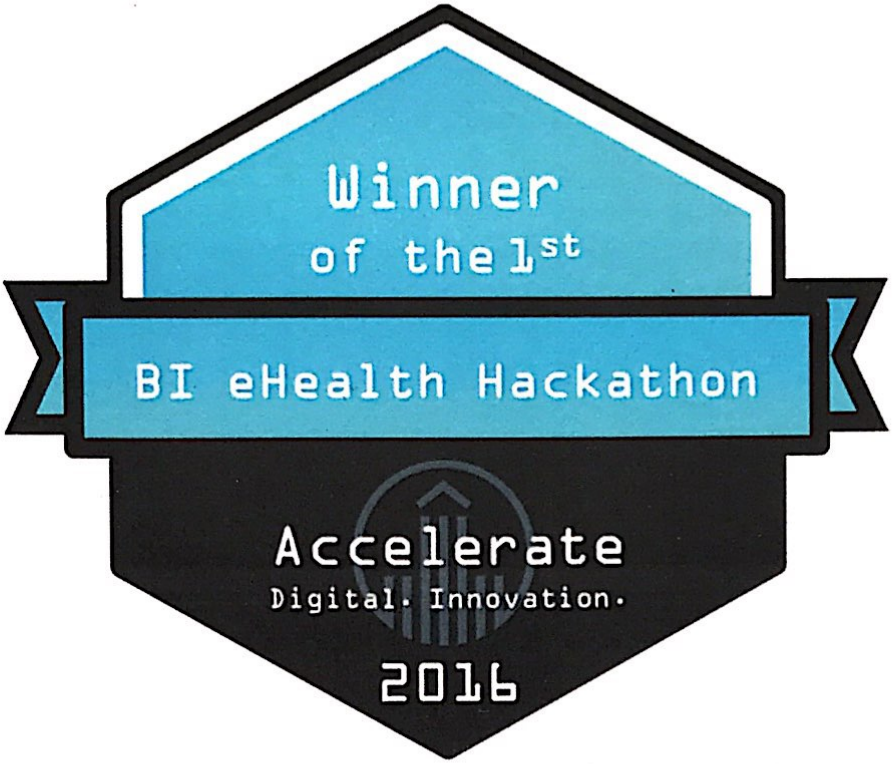
# N o t e n s p i e g e l

Studiengang: El. and Embedded Systems
(angestrebter) Abschluss: Master mit vorausg. Absch
PO-Version: 10

| PrNr | Prüfungstext | Semester | Note | Status | Credits | Versuche |
|---|---|---|---|---|---|---|
| 49402 | Circuits and Systems 1 | WS 2016 | 3,0 | BE | 5.0 | 1 |
| 49404 | Communication 2 | WS 2016 | 4,0 | BE | 5.0 | 1 |
| 5891 | Deutsch als Fremdsprache A 1 | WS 2016 | 1,7 | BE | 2.0 | 1 |
| 49403 | Signalprocessing 1 | WS 2016 | 3,6 | BE | 5.0 | 1 |
| 49407 | Advanced Control Systems | SS 2017 | 2,4 | BE | 5.0 | 1 |
| 49405 | Circuits and Systems 2 | SS 2017 | 2,0 | BE | 5.0 | 1 |
| 49401 | Communication 1 | SS 2017 | 2,5 | BE | 5.0 | 1 |
| 5892 | Deutsch als Fremdsprache A2 | SS 2017 | 1,3 | BE | 4.0 | 1 |
| 49408 | Embedded Computing | SS 2017 | 1,6 | BE | 10.0 | 1 |
| 49400 | Mathematics | SS 2017 | 1,3 | BE | 10.0 | 1 |
| 43036 | Processes and Automation in Photovoltaics | SS 2017 | 2,2 | BE | 5.0 | 1 |
| 49406 | Signalprocessing 2 | SS 2017 | 1,1 | BE | 5.0 | 1 |
| 43027 | System Analysis and Simulation with LabView | SS 2017 | 1,6 | BE | 5.0 | 1 |
| 43028 | Laboratory on Robotics | WS 2017 | --- | BE | 3.0 | 1 |

Diese Liste wurde maschinell erstellt und trägt daher keine Unterschrift.

Status: AN=angemeldet. BE=bestanden. EN=endgültig nicht bestanden. NB=nicht bestanden.




# Jagadeesh Kumar

was part of the winning team of the

## 1st BI eHealth Hackathon

Nov 16th-17th 2016 in Biberach

Martin Locher

Prof. Dr. Franz Brümmer

Serial Number: 100-317-20570
Issue Date: 6/29/2017
Expiration Date: 6/28/2019

NI CUSTOMER EDUCATION

# Certification

# Jagadeesh Kumar Ashok Kumar

Has successfully completed all requirements and is now granted the title of:


Certified LabVIEW
Associate Developer
National Instruments

Alex Davern
President and CEO
National Instruments

NATIONAL INSTRUMENTS

SKYLARK DRONES

**DATE: 26th July, 2016**

## TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr. Jagadeesh Kumar A,** has worked in our organization, **SKYLARK DRONES PRIVATE LIMITED** since **3rd August 2015 to 28th July 2016** designated as **Electronics and Flight Controller**.

He was responsible for the electronics and sensor integration of the Drones in our organization.

He possesses good technical knowledge and communication skills. During his tenure in our organization, we found his character and conduct to be satisfactory.

We wish him all success.

**For Skylark Drones Pvt. Ltd.**

SKYLARK DRONES PRIVATE LIMITED

**John Paul**
**HR-Admin**

Skylark Drones Pvt. Ltd.
IKP Eden, 16 Bhuvanappa Layout,
Tavarekere Main Road,
Bengaluru - 560 029, India
+91 - 806 565 8600 | info@skylarkdrones.com | www.skylarkdrones.com

Reg. No.: 1171110122

# SRM University

ESTABLISHED U/S 3 OF UGC ACT 1956

## Faculty of Engineering and Technology

The Board of Management of the SRM University

hereby makes known that

JAGADEESH KUMAR A

has been admitted to the Degree of

BACHELOR OF TECHNOLOGY IN

ELECTRONICS AND INSTRUMENTATION ENGINEERING

having been certified by duly appointed examiners to be qualified to receive the same and placed in the

FIRST CLASS

at the examination held in MAY - 2015

Given under the seal of the University.

DATED: 07 NOV 2015

SRM Nagar, Kattankulathur - 603 203
Kanchipuram Dist., Tamilnadu, India.

REGISTRAR

VICE-CHANCELLOR

# SRM UNIVERSITY

Established U/S 3 of UGC Act 1956

## B.Tech. DEGREE EXAMINATION

### TRANSCRIPT

FOLIO NO : **A36532**

| NAME OF THE CANDIDATE | JAGADEESH KUMAR A [05-Jan-1994] | REGISTER NUMBER | 1171110122 |
|---|---|---|---|

| Sem | Subject Code | Subject Title | Credits | Grade | Att Code | Month & Year of Passing |
|---|---|---|---|---|---|---|
| 1 | LE0101 | ENGLISH | 2 | B+ | 9 | DEC - 2011 |
| 1 | MA0101 | MATHEMATICS - I | 4 | B- | 9 | DEC - 2011 |
| 1 | PH0101 | PHYSICS | 3 | C | H | DEC - 2011 |
| 1 | CY0101 | CHEMISTRY | 3 | C+ | H | DEC - 2011 |
| 1 | GE0101 | BASIC ENGINEERING - I | 4 | B | H | DEC - 2011 |
| 1 | PD0101 | PERSONALITY DEVELOPMENT - I | 0 | - | 9 | DEC - 2011 |
| 1 | GE0107A | NSS | 1 | D | - | DEC - 2011 |
| 1 | GE0105 | COMPUTER LITERACY | 1 | B | H | DEC - 2011 |
| 1 | PH0103 | PHYSICS LABORATORY | 1 | B | H | DEC - 2011 |
| 1 | CY0103 | CHEMISTRY LABORATORY | 1 | A- | H | DEC - 2011 |
| 1 | ME0130 | ENGINEERING GRAPHICS | 3 | A- | H | DEC - 2011 |
| 2 | GE0108 | VALUE EDUCATION | 1 | C | H | MAY - 2012 |
| 2 | GE0102 | BIOLOGY FOR ENGINEERS | 2 | B- | H | MAY - 2012 |
| 2 | GE0104 | PRINCIPLES OF ENVIRONMENTAL SCIENCE | 2 | C | 9 | MAY - 2012 |
| 2 | MA0102 | MATHEMATICS - II | 4 | C+ | H | MAY - 2012 |
| 2 | PH0102 | MATERIAL SCIENCE | 3 | B- | H | MAY - 2012 |
| 2 | GE0106 | BASIC ENGINEERING - II | 4 | B | H | MAY - 2012 |
| 2 | EI0102 | ELECTRONIC DEVICES | 3 | B- | 9 | MAY - 2012 |
| 2 | PD0102 | PERSONALITY DEVELOPMENT - II | 0 | - | H | MAY - 2012 |
| 2 | CS0140 | COMPUTER PRACTICE | 2 | A+ | 9 | MAY - 2012 |
| 2 | ME0120A | WORKSHOP PRACTICE | 2 | A- | 9 | MAY - 2012 |
| 2 | EI0110 | DEVICES LABORATORY | 1 | B+ | H | MAY - 2012 |
| 3 | LE0201 | GERMAN - I | 2 | B+ | H | NOV - 2012 |
| 3 | MA0211 | MATHEMATICS - III | 4 | C+ | H | NOV - 2012 |
| 3 | CE0221 | ENGINEERING MECHANICS | 3 | B | H | NOV - 2012 |
| 3 | EI0201 | ELECTRICAL MACHINES | 3 | B- | H | NOV - 2012 |
| 3 | EI0203 | DIGITAL SYSTEMS | 3 | B | H | NOV - 2012 |
| 3 | EI0205 | ELECTRONIC CIRCUITS | 3 | B- | H | NOV - 2012 |
| 3 | EI0207 | ELECTRIC CIRCUITS AND NETWORKS | 3 | B- | H | NOV - 2012 |
| 3 | PD0201A | PERSONALITY DEVELOPMENT - III | 1 | C+ | H | NOV - 2012 |
| 3 | EI0213 | CIRCUITS LABORATORY | 1 | A | H | NOV - 2012 |
| 3 | EI0215 | ELECTRICAL AND ELECTRONICS LABORATORY | 1 | A+ | H | NOV - 2012 |
| 4 | LE0202 | GERMAN - II | 2 | B | 9 | MAY - 2013 |
| 4 | MA0212 | PROBABILITY AND QUEUING THEORY | 4 | C+ | 9 | MAY - 2013 |
| 4 | ME0232 | THERMODYNAMICS AND FLUID MECHANICS | 3 | C+ | 9 | MAY - 2013 |
| 4 | EI0202 | LINEAR INTEGRATED CIRCUITS | 3 | C+ | 9 | MAY - 2013 |
| 4 | EI0204 | TRANSDUCERS ENGINEERING | 3 | C+ | 9 | MAY - 2013 |
| 4 | EI0206 | ELECTRICAL AND ELECTRONICS MEASUREMENTS AND INSTRUMENTATION | 3 | A- | 9 | MAY - 2013 |
| 4 | EI0208 | COMMUNICATION ENGINEERING | 3 | C | 9 | MAY - 2013 |
| 4 | PD0202A | PERSONALITY DEVELOPMENT - IV | 1 | B+ | 9 | MAY - 2013 |
| 4 | EI0212 | LINEAR AND DIGITAL INTEGRATED CIRCUITS LABORATORY | 1 | B | 9 | MAY - 2013 |
| 4 | EI0214 | TRANSDUCER ENGINEERING LABORATORY | 1 | A- | 8 | MAY - 2013 |
| 5 | MB0301 | ENGINEERING ECONOMICS AND MANAGEMENT | 3 | B | H | NOV - 2013 |

| BRANCH / SPECIALISATION | ELECTRONICS AND INSTRUMENTATION ENGINEERING | MONTH & YEAR OF LAST APPEARANCE | MAY - 2015 |
|---|---|---|---|

| Sem | Subject Code | Subject Title | Credits | Grade | Att Code | Month & Year of Passing |
|---|---|---|---|---|---|---|
| 5 | EI0303 | INDUSTRIAL INSTRUMENTATION | 3 | C+ | 9 | NOV - 2013 |
| 5 | EI0305 | CONTROL SYSTEMS | 3 | C- | H | NOV - 2013 |
| 5 | EI0307 | MICROPROCESSORS AND MICROCONTROLLERS | 3 | B | H | NOV - 2013 |
| 5 | EI0309 | ANALYTICAL INSTRUMENTATION | 3 | B- | H | NOV - 2013 |
| 5 | EI0311 | DIGITAL SIGNAL PROCESSING | 3 | B | H | NOV - 2013 |
| 5 | PD0301A | PERSONALITY DEVELOPMENT - V | 2 | B- | H | NOV - 2013 |
| 5 | EI0313 | MICROPROCESSORS AND MICROCONTROLLERS LABORATORY | 1 | B+ | H | NOV - 2013 |
| 5 | EI0315 | CONTROL ENGINEERING LABORATORY | 1 | A+ | 9 | NOV - 2013 |
| 5 | EI0319 | COMPREHENSION - I | 1 | B+ | H | NOV - 2013 |
| 5 | EI0321 | INDUSTRIAL TRAINING - I | 1 | A+ | 9 | NOV - 2013 |
| 6 | EI0302 | POWER ELECTRONICS | 3 | C- | 9 | MAY - 2014 |
| 6 | EI0310 | VLSI DESIGN AND EMBEDDED SYSTEMS | 3 | C- | 9 | MAY - 2014 |
| 6 | EI0304 | DIGITAL SYSTEM DESIGN | 3 | E | 9 | MAY - 2014 |
| 6 | EI0306 | PROCESS CONTROL | 3 | D | 9 | MAY - 2014 |
| 6 | EI0308 | INDUSTRIAL DRIVES AND CONTROL | 3 | C | H | MAY - 2014 |
| 6 | EI0354 | MODERN CONTROL SYSTEMS | 3 | C- | 9 | MAY - 2014 |
| 6 | PD0302A | PERSONALITY DEVELOPMENT - VI | 2 | B+ | 9 | MAY - 2014 |
| 6 | EI0312 | ELECTRONIC DESIGN PROJECT LABORATORY | 1 | B | H | MAY - 2014 |
| 6 | EI0314 | PROCESS CONTROL LABORATORY | 1 | C- | H | MAY - 2014 |
| 6 | EI0316 | COMPUTER SKILLS | 2 | B+ | 9 | MAY - 2014 |
| 6 | EI0318 | COMPREHENSION - II | 1 | B- | 9 | MAY - 2014 |
| 7 | EI0401 | VIRTUAL INSTRUMENTATION | 3 | B | 9 | NOV - 2014 |
| 7 | EI0403 | COMPUTER CONTROL OF PROCESSES | 3 | B | H | NOV - 2014 |
| 7 | EI0405 | INDUSTRIAL AUTOMATION | 3 | B- | H | NOV - 2014 |
| 7 | EI0451 | ROBOTICS AND AUTOMATION | 3 | C+ | H | NOV - 2014 |
| 7 | EI0459 | POWER PLANT INSTRUMENTATION | 3 | C+ | 9 | NOV - 2014 |
| 7 | EI0413 | VIRTUAL INSTRUMENTATION LABORATORY | 1 | A | H | NOV - 2014 |
| 7 | EI0415 | AUTOMATION LABORATORY | 1 | A- | H | NOV - 2014 |
| 7 | EI0417 | INDUSTRIAL TRAINING - II | 1 | A+ | H | NOV - 2014 |
| 8 | EI0458 | INSTRUMENTATION AND CONTROL IN PETROCHEMICAL INDUSTRIES | 3 | C | 9 | MAY - 2015 |
| 8 | EI0460 | INSTRUMENTATION AND CONTROL IN IRON AND STEEL INDUSTRIES | 3 | C+ | H | MAY - 2015 |
| 8 | EI0444 | PROJECT WORK | 8 | A+ | H | MAY - 2015 |

***** End Of Statement *****

**CGPA : 7.512**

**CGPA is Calculated from Third Semester Onwards**

Date : 28-Mar-2016

Medium of Instruction : English

SRM Nagar
Kattankulathur - 603 203
Kancheepuram (Dt), Tamil Nadu, India.

This Certificate bears no correction

Registrar

## GRADING

| Letter Grade | A+ | A | A- | B+ | B | B- | C+ | C | C- | D | E | U | W | I |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grade Points | 10 | 9.5 | 9.0 | 8.5 | 8.0 | 7.5 | 7.0 | 6.5 | 6.0 | 5.0 | 4.0 | 0 | 0 | 0 |

U - Failure due to insufficient marks

W - Failure due to insufficient attendance

I - Incomplete due to absent

## CALCULATION OF CGPA

$$\text{The Cumulative Grade Point Average (CGPA)} = \frac{\Sigma(C \times GP)}{\Sigma C}$$

Where, C = Credit of the course

GP = Grade Points obtained for the course

CGPA is calculated considering all the courses taken from third semester onwards.

## ATTENDANCE CODE (Att. Code)

| Attendance Percentage | 95 % and above | 85 to 94% | 75 to 84% | Below 75% |
|---|---|---|---|---|
| Code | H | 9 | 8 | L |

| | |
|---|---|
| Read by | |
| Verified by | |

# JAGADEESH KUMAR. A

jagadeesh.srmuniv@gmail.com | 017624082328 | Zugspitzstraße 80, Vaterstetten, DE – 85591

## ELECTRICAL AND EMBEDDED SYSTEMS ENGINEER

## AREAS OF EXPERTISE

- Embedded Systems
- Hardware Development
- Electrical Engineering
- UAV Flight Control
- VHDL & SystemC
- Signal Processing
- Microcontrollers
- Telecommunication
- Circuit Design (EAGLE)
- Data Acquisition
- Instrumentation
- Matlab & LabVIEW

## SELECTED CAREER HIGHLIGHTS

- Versatile Experience in technical aspects as well as behavioral conduct at **Skylark Drones Pvt. Ltd.** This includes: in-time product delivery, task management and meeting clients' requirements.
- With technical support and financial aid from my Bachelor University, I founded a student organization to develop and research on UAVs, namely, **Student Copters Research Organization (SCRO)**. I also lead the control and power systems domain and successfully developed a custom flight control system for a quadcopter.
- Attained significant exposure in electronic systems by designing a miniature satellite to measure various atmospheric parameters and transmit the data through live feed telemetry to the ground station, while participating at the **Annual CanSat Competition, 2014** held at **Abilene, Texas, USA**, conducted by the prestigious organizations, **AIAA and NASA.**

## PROFESSIONAL EXPERIENCE

**TECHNICAL UNIVERSITY OF MUNICH,** Munich, Deutschland 08/2017 – present
***Master's Thesis***

- Delivering a hardware solution to measure the atmospheric Carbon dioxide concentration with high accuracy and a precision of 0.02 ppm using Tunable Diode Laser Absorption Spectroscopy.
- Develop and implement the TDLAS control circuit with Temperature controllers and Laser diode drivers.
- Simulate the results and compare with the current available technologies.
- Publish a paper on the results of this hardware and the other contemporary measurement technologies.

**SKYLARK DRONES PVT. LTD.,** Bengaluru, India 08/2015 – 07/2016
***Electronics and Flight Control Engineer***

- Drove profitable operations, including successful project completions in Aerial surveillance using drones and UAVs.
- Key team member responsible for the electronics integration and monitoring the health of the drones.
- Managed the on-field operations and responsible for live data acquisition from in-flight drones.
- Offered skilled manual piloting of the drones and controlled autonomous navigation.
- Accolades received for actively involving in Research and Development.
- Directed and trained new intern students on handling drones and its electronics.

**HS RAVENSBURG WEINGARTEN,** Weingarten, Deutschland 10/2016 – 02/2017
***System On Chip Designer (Work Student)***

- Delivered an 8-bit Tester Chip and Port Expander Board, using development environments such as EAGLE PCB designer and ModelSim.
- Eliminated errors in the design and boosted the performance of the design by 30% with minimum internal memory.
- Created VHDL scripts and Testbench codes to support XILINX FPGA review.
- Simultaneously developed a SystemC program with a focus on the timing and RTL of certain blocks of 8051 Microcontroller and Synthesized the same using XILINX ISE design suit.

**HS RAVENSBURG WEINGARTEN,** Weingarten, Deutschland 10/2016 – 07/2017
***Embedded Computing Engineer***

- Developed a system for QR code tracking by image processing using OpenCV and Raspberry Pi.
- Also achieved detection of distance between the Camera and the QR code in all the 3 axis, with a given focal length of the camera.
- Successfully implemented the same for swarm robots, where slave carts would track and follow the master cart holding a QR code.

**HS RAVENSBURG WEINGARTEN,** Weingarten, Deutschland 10/2016 – 07/2017
***Student Assistant***

- Designed various Higher Order Filters and implemented them using the Arduino Due Microcontroller.
- Realized various complicated Signal Processing circuits using PicoScope and Matlab.
- Assisted the Research and Development department by testing various DSPs and Communication Systems.

**BOEHRINGER INGELHEIM PHARMA GmbH,** Biberach, Deutschland 11/2016 – 12/2016
***Software Developer (Work Student)***

- Successfully presented our team's idea and secured a place at the Boehringer eHealth Hackathon.
- Developed a Raspberry Pi based eHealth monitoring system to record and simultaneously upload the feed values from different health sensors such as Blood Pressure, Temperature, Sugar level sensor, etc. to the cloud.

## EDUCATION AND AFFILIATIONS

**Qualification** ***Master of Engineering in Electrical Engineering and Embedded Systems.***
**Duration** 09/2016 – 03/2018 (Expected).
**Organization** Hochschule Ravensburg Weingarten, 88250, Weingarten, Deutschland.

| **Principal Subjects** | **Core Competencies** |
|---|---|
| ▪ Advanced Mathematics | MATLAB, GNU OCTAVE |
| ▪ Signal Processing | MATLAB and Picoscope |
| ▪ Telecommunication Technology | Cadence OrCAD, PSpice |
| ▪ Embedded Computing | C/C++, Rasberry Pi & Arduino |
| ▪ System on Chip | EAGLE, VHDL, SystemC |
| ▪ Embedded Control | MATLAB, Control System |

**Qualification** ***Bachelor of Technology in Electronics and Instrumentation Engineering.***
**Duration** 07/2011 – 05/2015
**Organization** SRM University, 603203, Chennai, India.
**Principle Subjects**
VLSI Design and Embedded Systems, Virtual Instrumentation, Communication Technology, Control Systems, Digital Systems, DSP, Microcontrollers, Power Electronics, Electrical Machines.
**Bachelor Project** ***Smart Glass:*** *Holographic Projection and gesture control of Computer.*