

Cover sheet to application

1 Personal data application

Name, first name	Suyash Mahar		
subject area	Electrical Engineering		
personal ID	91732179		
University	Universität Paderborn		
offer country	India		
Scholarship programme	Working Internships in Science and Engineering (WISE), 2019		
Scholarship period	May 10, 2019	to	Jul 31, 2019
Resp. DAAD Unit	A13 AS New Delhi		

2 Documents for application

which you upload your application documents are listed below.

Type of document	Name of the document
DAAD-Bewerbungsformular	Application
Lebenslauf	cv
Publikationsliste	publications-list
Vorhaben/Motivation	motivation-letter
Vorhaben/Motivation	project-description
Kontakte Gastinstitution	contacts-at-host-institution
Hochschulzeugnisse	transcript
Zulassung	certificate-of-enrolment
Zulassung	no-objection
Nachweis Lehr-/Berufserfahrung/Praktika	past-internship
Sonstiges	invitation-letter
Sonstiges	approval-form

Application

1 General information

Scholarship programme	Working Internships in Science and Engineering (WISE), 2019
Status	Students

2 Details for application

Note on completing the application form:

* Compulsory field (must be completed).

(*)Dependant compulsory field (must be completed if at least one other field in this section is completed).

1 Family name *	Mahar		
if applicable, name at birth			
Academic title	Select title...		
First name(s) *	Suyash		
Date of birth *	12.06.1999	Place of birth *	Champawat
Nationality *	Indian	2. Nationality	Select nationality ...
Form of address *	Mr.	Marital status *	single
Number of children	0		

2 Details for application**2 Home address**

(Address at which you can be contacted currently)

c/o name

street address or PO box * F-159, Ravindra Bhawan, IIT Roorkee

Zip code 247667

City * Roorkee

Country * India

Telephone number

Mobile phone number +91-7579106878

Fax

Email address * suyash12mahar@outlook.com

Only use these fields to enter additional address information that find no place in the standard mandatory address details above.

2 Details for application

3 Name and address of next of kin who should be contacted in an emergency.

yes no

Name	Mahar
First name	Suresh Singh
Additional address information 1	
Additional address information 2	
c/o name	A B Kandpal
street address or PO box	446, Near Sushila Tiwari Branch, Polysheet
Zip code	263126
City	Kathgodam
Country	India
Telephone number	
Mobile phone	+91-9412923809
Fax	
Email address	suresh03mahar@outlook.com

4

2 Details for application

Please enter your destination institution / university

Planned destination institution 1 *

Destination country *	Germany	City *	Paderborn
Institution *	Universität Paderborn		
Other institution	<input type="checkbox"/>		
Subject group *	Engineering		
Subject *	Electrical Engineering		

Planned destination institution 2

alternatively



additionally



None



5 Subject area / discipline / research field the application refers to

Subject group *	Engineering
Subject *	Electrical Engineering
Explanation	

6 What made you choose your host institution/host university? *

From my last internship which was on energy efficiency, I came across Prof. Plessl's work at PC2 group. I found it to be really interesting and close to my previous research experience, moreover his group's work is more related to future computing paradigms which I find to be particularly intriguing.

Is your stay part of a cooperation agreement? *

yes none

7 Do you already have contacts there? *

yes none

With Whom? Professor Doctor Christian Plessl

2 Details for application

8 Do you have an invitation from the host/destination institute? *

yes No

9 Duration of requested funding: from * 10.05.2019 to * 31.07.2019

10 Short description of research/study/work project *(An extensive description should be added on a separate sheet) A key research area in which Dr. Plessl's research group PC2 works is the development of FPGA accelerators. One Specific area, where I am expected to contribute is the implementation of low precision linear algebra operations (approximate computing). My work is expected to be embedded in an ongoing project on approximate computing at PC2. The specific task and working areas during my internship are:

1. Development of FGPA accelerators for low-precession linear algebra using OpenCL high-level synthesis
2. Synthesizing and optimizing the accelerators

11 Secondary school *

Type of qualification * Senior Secondary Examination

Date * 21.05.2016 City / Province * Kathgodam

Result * 94/100

Length of school attendance

from * 01.07.2014 to * 03.06.2016

12 Completed examinations (if applicable) (*)

Entry 1

Institution

Period: from

to

Subject group

Select group...

Subject

(Please select first group of subjects.)

Type of exam

Select test ...

Result

[new entry](#)

[Delete this entry](#)

2 Details for application

13

Current/last home Institution

Institution *

Indian Institute of Technology Roorkee

Type study programme *

Bachelor of Technology

Major *

Subject group *

Engineering

Subject *

Engineering (misc.)

2nd subject

Subject group

Select group...

Subject

(Please select first group of subjects.)

3rd subject

Subject group

Select group...

Subject

(Please select first group of subjects.)

14

Previous study/research/working stays or other activities abroad

Entry 1

Country

USA/United States of America

Institution, City/Province Carnegie Mellon University,Pittsburgh,PA

Period: from

21.05.2018

to

30.07.2018

Purpose

Undergraduate Research Internship

new entry

Delete this entry

2 Details for application

15 Previous and current scholarships from the DAAD or other organisations *

yes none

Funding organisation / programme *	from *	to *

16 Will you be funded by another organisation during the planned funding period or have you applied for other funding for this period? *

yes no

From which?

Organisation *	Status	from *	to *
	Select status...		
	Select status...		
	Select status...		

2 Details for application

17 Language skills (not documented)

Language	very good	good	average	poor
English	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hindi	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
French	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

Description of other language(s)

18 What other extracurricular activities/interests would you like to mention?

I am interested in teaching and was awarded a dedicated member award for teaching underprivileged children in my first year at the university. I have also been TA for two of the courses where I taught students the basics of the courses and got a chance to interact with them at a personal level. I am also particularly interested in research related to computing hardware and have worked on several projects related to it.

19 Professional goal

Do meaningful research

20

Other comments/information you think might be of relevance to your application or which should be included in the assessment of your achievements and personal suitability
(e.g. details about special extracurricular activities, but also impediments such as illness or disability, if this had a negative impact on your academic progress/achievements and should be considered in a comparison of applicants).

I have been working on computing hardware research work from one of the projects I did during my second year at the university lead to a conference publication which is to appear at ICDCN, 2019. This and the other projects have taught me a lot of important skills like teamwork, managing research data and research techniques which I have found to be very useful in research work and in life in general.

2 Details for application**Important notice**

Please save the form after editing on your computer. Please use the „save as“ option to be aware of the file location of the last edited version of the application form on your computer. You can return to the portal to upload the edited form and continue your application by clicking the link

[DAAD-Portal öffnen](#)

Education

- **Indian Institute of Technology, Roorkee** Roorkee, India
B.Tech., Electronics and Communication Engineering (CGPA: 9.1/10) July 2016 - Present
 - **Coursework includes:** Computer Architecture and Microprocessors*, Digital Logic Design*, Embedded System Design (ongoing) and Data Structures & Algorithms.
 - * Grade for outstanding performance

Publications

- D. Saxena, S. Mahar, V. Raychoudhury, J. Cao
- **Scalable, High-speed On-chip-based NDN Name Forwarding using FPGA**
To appear in *International Conference on Distributed Computing and Networking (ICDCN), Bangalore, 2019*

Work Experiences

- **Design of accurate energy estimation tool for DRAM [poster]** Carnegie Mellon Univ., USA
Dr. Saugata Ghose, SAFARI research group May 2018 - July 2018
 - Worked on architecture and implementation of a tool to estimate energy consumption of DRAM.
 - Work includes finding a methodology for accurately extracting energy of individual DRAM commands from standard command loop's current.
 - Devised new methodology for estimating energy of a memory request trace to increase its accuracy.
- **Design of efficient FIB table for NDN routers** IIT Roorkee, India
Prof. Vaskar Raychoudhury and Dr. Divya Saxena July 2017 - January 2018
 - Worked on ways to accelerate FIB lookups in NDN routers using re-configurable hardware.
 - Work included designing efficient data-structure for the FIB and implementing it on an FPGA.
 - Speedup of up to ~ 4.1 compared to previously proposed FPGA based design was obtained.
- **FPGA implementation of CORDIC algorithms [report]** IIT Roorkee, India
Prof. Bishnu Prasad Das May 2017
 - Studied and implemented CORDIC algorithms on FPGA.
 - Used Python (Jupyter notebook) for modeling and Verilog for design and implementation.
- **Single-cycle 32-bit RISC processor [link]** June 2017
Hobby project
 - Created a simple implementation of 32-bit MIT 6.004 architecture with improvements and additions.

Teaching Experiences

- **Object-oriented programming: Undergraduate teaching assistant** CSE, IIT Roorkee, India
Enrollment: 85 July 2018 - Present
 - Helping freshers with little or no experience in programming to get started with basics of Java.
- **Digital Logic Design: Undergraduate teaching assistant [Repository]** ECE, IIT Roorkee, India
Enrollment: 85 January 2018 - April 2018
 - Work included writing assignment series on hardware description using Verilog HDL for ECN104 and teaching students basics of hardware description using Verilog.
- **Tutor - Grade 12 and below** National Service Scheme, IIT Roorkee
Enrollment: 2-3 students September 2016 - April 2017
 - Taught underprivileged students from nearby areas for free of cost.
 - Awarded dedicated member award for overall performance.

Awards and Achievements

- Dedicated member award, National Service Scheme (IIT Roorkee) April 2017
- **Joint Entrance Examination, Advanced (Indian Institute of Technology)** May 2016
All India Rank 1387, 99.3 percentile
- **International Cyber Olympiad (SilverZone)** Dec. 2014
Olympiad Rank 11, State Rank 1

Other Projects

- **.gitignore file manager for Linux (Shell programming)** [link] December 2017
Project work includes writing BASH shell script.
- **Triangle art generating views (Java programming, Team size: 3)** [link] March 2017 - May 2017
Uses Delaunay triangulation and custom coloring algorithm for generating views for Android.

Extra-Curricular

- **IEEE Student's Branch, Special Interest Group** IIT Roorkee, India
Member September 2017 - Present
 - Gave talks and held discussions on history and current topics of interest in the tech field.
- **Mobile Development Group** [link] IIT Roorkee, India
Android Development January 2017 - present
 - Delivered several institute and group level talks and lectures on Android development and coding practices.

Interests

- Re-configurable computing, Computer architecture, Digital logic design and Heterogeneous computing.

Skills

Languages: (System)Verilog, C++, MIPS assembly, SPICE, L^AT_EX, Python, Bash, C#.NET, Java

Software: Vivado, MatLab, LTspice, Cadence Virtuoso, Visual Studio 2017

Languages: English, Hindi

Publications List

Conference Papers

(Peer-Reviewed)

Saxena, D., **Mahar, S.**, V. Raychoudhury and J. Cao, “*Scalable, High-speed On-chip-based NDN Name Forwarding using FPGA,*”
To appear in International Conference on Distributed Computing and Networking (ICDCN), Bangalore, Jan. 4-7, 2019

Applicant details:

Suyash Mahar

F-159, Ravindra Bhawan
IIT Roorkee, 247667 – India

DAAD Application Number: 57460839/94E8D14D6C1

Letter of Motivation

Suyash Mahar
F-159, Ravindra Bhawan
IIT Roorkee, Uttarakhand
247667 India
(91) 7579106878
Application Number: 57460839/94E8D14D6C1

27 October 2018

Dear members of the selection committee,

With this letter, I would like to express my interests in being selected for a research internship at Universität Paderborn during summer 2019 with a scholarship for DAAD WISE. I'm Suyash Mahar, currently a 3rd year undergraduate student majoring in Electronics and Communication Engineering at the Indian Institute of Technology Roorkee.

Since my introduction to digital electronics in my freshmen year, I have been fascinated by how such simple devices help run such complex machines in perfect synchrony. This curiosity led to a hobby project where I designed a custom processor, it gave me an early idea regarding what to work on, which included a research project with a professor at my current university. As I started to work in this field, I found out that I like to design and architect things, which increased my interest in the field. With my last internship at Carnegie Mellon University, my beliefs were strengthened that I am interested in research work particularly in the field of Hardware Architecture.

My past experiences were extremely helpful in teaching me how to conduct research work, write reports, papers, and posters. These projects included a variety of tasks including literature review, designing experiments, analysing results, drawing conclusions and working in a team. I believe these experiences will be help me be efficient and productive during my internship.

I got to know about DAAD scholarship when I was searching for undergraduate research internship programmes mandated by my coursework. During my last internship, I came across the work at Universität Paderborn's PC² group and found it to be quite interesting and related to my work particularly in approximate computing. Since DAAD funds projects at public German universities, this is a unique opportunity for me to work on something which I find very interesting and intriguing. And, since I plan to pursue a research career in computer engineering this scholarship would go a long way in making me a better research enthusiast.

As a closing note, I would really want to appreciate members of DAAD for providing me this opportunity.

Thank you for your time.

Kind Regards,
Suyash Mahar

Project Description

A key research area in which Prof. Dr. Christian Plessl's research group, PC² works is the development of FPGA accelerators. One Specific area, where I am expected to contribute is the implementation of low precision linear algebra operations (approximate computing) on FPGA. My work is expected to be embedded in an ongoing project on approximate computing at PC². This tentative period of this work is from **May 10, 2019** until **July 31, 2019**.

The specific task and working areas during my internship are:

1. development of FGPA accelerators for low-precession linear algebra using OpenCL high-level synthesis,
2. synthesizing and optimizing the accelerators,
3. measuring performance and energy-consumption,
4. comparison with CPU and
5. presenting the results at a seminar.

Applicant details:

Suyash Mahar

F-159, Ravindra Bhawan

IIT Roorkee, 247667 – India

DAAD Application Number: 57460839/94E8D14D6C1

Contact Details of Host at Germany

Professor

Prof. Dr. Christian Plessl

Chairman of the Board and Managing Director
Paderborn Center for Parallel Computing
Warburger Street 100
33098 Paderborn

Room O2.167
Phone +49 5251 60-5399
Fax +49 5251 60-1714
Mail christian.plessl@upb.de
Web www.upb.de/pc2

Secretary

Michaela Kemper

Administrative Assistant
Paderborn Center for Parallel Computing (PC²)

Room O2.164
Phone +49 5251 60-1735
Fax +49 5251 60-1714
Mail michaela.kemper@upb.de

Applicant details

Suyash Mahar

F-159, Ravindra Bhawan
IIT Roorkee, 247667 – India
DAAD Application Number: 57460839/94E8D14D6C1

**INDIAN INSTITUTE OF TECHNOLOGY ROORKEE
ROORKEE - 247 667, INDIA**

GRADE SHEET 2016-17 SESSION

AUTUMN SEMESTER

ENROLLMENT NO.: 16116069

NAME : SUYASH MAHAR

CLASS : BACHELOR OF TECHNOLOGY (ELECTRONICS & COMMUNICATION) I YEAR

SUBJECT CODE	TITLE OF SUBJECT	CREDITS	GRADE OBTAINED
CEN-105	INTRODUCTION TO ENVIRONMENTAL STUDIES	3	A
CSN-103	FUNDAMENTALS OF OBJECTS ORIENTED PROGRAMMING	4	A
ECN-101	INTRODUCTION ELECTRONICS AND COMMUNICATION ENGINEERING	2	B
HSN-001A	COMMUNICATION SKILLS (BASIC)	2	B+
HSN-002	ETHICS AND SELF AWARENESS	2	A
MAN-001	MATHEMATICS-I	4	B+
PHN-005	ELECTRODYNAMICS AND OPTICS	4	B

* Re-Examination

REGISTERED CREDIT IN SEMESTER : 21

EARNED CREDIT IN SEMESTER : 21

TOTAL EARNED CREDITS : 21

S.G.P.A. : 9.143

C.G.P.A. : 9.143

DATE: 26-Dec-2016 Prepared by.....  Checked by.....  ASSISTANT REGISTRAR (AS)

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

ROORKEE - 247 667, INDIA

GRADE SHEET 2016-17 SESSION

SPRING SEMESTER

ENROLLMENT NO.: 16116069

NAME : SUYASH MAHAR

CLASS : BACHELOR OF TECHNOLOGY (ELECTRONICS & COMMUNICATION) I YEAR

SUBJECT CODE	TITLE OF SUBJECT	CREDITS	GRADE OBTAINED
CSN-102	DATA STRUCTURES	4	A
ECN-104	DIGITAL LOGIC DESIGN	4	O
ECN-142	SEMICONDUCTOR DEVICES	4	A
EEN-112	ELECTRICAL SCIENCE	4	B+
MAN-002	MATHEMATICAL METHODS	4	C+
PHN-006	QUANTUM MECHANICS AND STATISTICAL MECHANICS	4	B+
PR-502	N.S.S.	2	B+

* Re-Examination

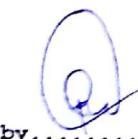
REGISTERED CREDIT IN SEMESTER : 26

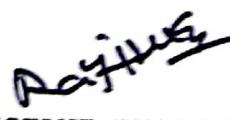
EARNED CREDIT IN SEMESTER : 26

TOTAL EARNED CREDITS : 47

S.G.P.A. : 9.154

C.G.P.A. : 9.149

DATE: 12-Jun-2017 Prepared by N.S.C. Checked by 

 ASSISTANT REGISTRAR (AS)

**INDIAN INSTITUTE OF TECHNOLOGY ROORKEE
ROORKEE - 247 667, INDIA**

GRADE SHEET 2017-18 SESSION

AUTUMN SEMESTER

ENROLLMENT NO.: 16116069

NAME : SUYASH MAHAR

CLASS : BACHELOR OF TECHNOLOGY (ELECTRONICS & COMMUNICATION) II YEAR

SUBJECT CODE	TITLE OF SUBJECT	CREDITS	GRADE OBTAINED
CSN-221	COMPUTER ARCHITECTURE AND MICROPROCESSORS	4	O
ECN-203	SIGNALS AND SYSTEMS	4	B+
ECN-205	ANALOG CIRCUITS	4	B+
ECN-291	ELECTRONIC NETWORK THEORY	4	B+
HSS-01	ECONOMICS	3	B+
MIN-108	MECHANICAL ENGINEERING DRAWING	4	O

* Re-Examination

REGISTERED CREDIT IN SEMESTER : 23

EARNED CREDIT IN SEMESTER : 23

TOTAL EARNED CREDITS : 70

S.G.P.A. : 9.348

C.G.P.A. : 9.214

DATE: 20-Dec-2017 Prepared by... *BB* Checked by... *SA* *futu* ASSISTANT REGISTRAR (AS)

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

ROORKEE - 247 667, INDIA

GRADE SHEET 2017-18 SESSION

SPRING SEMESTER

ENROLLMENT NO.: 16116069

NAME : SUYASH MAHAR

CLASS : BACHELOR OF TECHNOLOGY (ELECTRONICS & COMMUNICATION) II YEAR

SUBJECT CODE	TITLE OF SUBJECT	CREDITS	GRADE OBTAINED
ECN-212	PRINCIPLES OF DIGITAL COMMUNICATION	4	B+
ECN-222	AUTOMATIC CONTROL SYSTEMS	4	B
ECN-232	ENGINEERING ELECTROMAGNETICS	4	C+
ECN-252	DIGITAL ELECTRONIC CIRCUITS LABORATORY	2	A
MAN-006	PROBABILITY AND STATISTICS	4	A
MTN-105	ELECTRICAL AND ELECTRONIC MATERIALS	4	A

* Re-Examination

REGISTERED CREDIT IN SEMESTER : 22

EARNED CREDIT IN SEMESTER : 22

TOTAL EARNED CREDITS : 92

S.G.P.A. : 8.909

C.G.P.A. : 9.141

DATE: 21-Jun-2018 Prepared by Checked by ASSTT. REGISTRAR (EVALUATION)

Evaluation and Grading

The students shall be graded for their academic performance on a ten point scale in the following manner :

Academic Performance	Letter Grade	Grade Points (p)
Exceptional Good / Outstanding	O	10
Excellent	A	10
Very Good	B+	9
Good	B	8
Fair	C+	7
Average	C	6
Below Average	D+	5
Marginal	D	4
Fail due to poor performance	F	0
Fail due to short attendance	FS	0
Pass in Audit Courses	AP	-
Fail in Audit Courses	AF	-
Incomplete	I	-
Continued Project	X	-
Satisfactory	S	-
Unsatisfactory	U	-

Calculation of Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA)

The letter Grades awarded to a student in all the courses (except audit courses) shall be converted into a semester and cumulative performance index called the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA), to be calculated as follows :

$$S.G.P.A. = \frac{\sum_{i=1}^n C_i \times p_i}{\sum_{i=1}^n C_i}$$

where

C_i = Number of credits of the i course of a semester for which SGPA is to be calculated

p_i = Grade point obtained in i course.

i = 1,.....,n, represent the number of courses in which a student is registered in the concerned semester.

$$C.G.P.A. = \frac{\sum_{i=1}^m C_i \times p_i}{\sum_{i=1}^m C_i}$$

where

C_i = Number of credits of the i course, upto the semester for which CGPA is to be calculated. The CGPA shall be calculated taking all the subjects registered including a course in which 'F' grade is awarded till date starting from the beginning but if the student has cleared a course, in which the student had backlog, the new grade will replace the old grade while calculating CGPA.

p_i = Grade point earned in i course.

i = 1,.....,m; represent the number of courses in which a student was registered till date.

Conversion of CGPA to Percentage

The equivalent percentage of CGPA at the end of the programme will be calculated as per formula given below :

CGPA	Equivalent percentage of marks
$5.00 \leq CGPA \leq 9.00$	$10 * CGPA + 5.00$
$CGPA > 9.00$	95.00

Die Bundesagentur für Arbeit benötigt die folgenden Angaben für die Genehmigung eines studienfachbezogenen Praktikums.
Danke für Ihre Mitwirkung!
The German Federal Employment Agency needs certain information to be able to decide on the approval of an Internship.
Thank you for your cooperation!

Immatrikulationsbescheinigung Certificate of Enrolment

Indian Institute of Technology Roorkee.....
(Bezeichnung der Universität/Hochschule // Name of the university/college)

Anschrift der Universität/Fachhochschule
Full address of the university/college Roorkee, Haridwar, Uttarakhand, India - 247667

Homepage: <https://www.iitr.ac.in/>

Nachname(n) der/des Studierenden
Last name(s) of the student
Mahar.....

Vorname(n) der/des Studierenden
Given name(s) of the student
Suyash.....

geboren am
Date of birth 1 2 . 0 6 . 1 9 9 9
Tag day Monat month Jahr year

Staatsangehörigkeit Indian.....
Citizenship

Studiengang
Programme of study

Bachelorstudium Masterstudium Doktorand andere Hochschulbildung mit Mindestlaufzeit von 3 Jahren
undergraduate graduate postgraduate other higher education with minimum duration of 3 years

Studiengang: Electronics and Communication Eng., angestrebter akad. Grad: Bachelor of Technology.....
Subject of study expected academic degree

Die Studienordnung beinhaltet ein Pflichtpraktikum: Ja Nein
An Internship is a mandatory and integral part of the course of studies: Yes No

Vorgeschriebene Dauer des Pflichtpraktikums:Monate, davon bereits absolviert:Monate.
Length of the mandatory Internship:months. Have parts of the Internship already been done:
 No Yes,months.

Eingeschriebene/r Student/in seit
Enrolled as a student since 2 1 . 0 7 . 2 0 1 6
Tag day Monat month Jahr year

Regeldauer des Studiums4.....Jahre
Duration of study years

Wenn alle formalen Voraussetzungen des Studiums erfüllt sind, wird das Studium am 1 0 5 2 0 2 0 beendet.
The programme of study will be finished by

D. Bhawal
Tag day Monat month Jahr year
22.10.2018

Datum:
Date 2 2 . 1 0 . 2 0 1 8
Tag day Monat month Jahr year

.....Prof. & Head.....
Stamp of the University/College
Indian Institute of Technology Roorkee
Roorkee-247 667, India
Stamp of the university/college
and signature of an authorized person

Regional Office New Delhi
Bangladesh, Bhutan, India, Nepal, Sri Lanka

- No Objection certificate -
Working Internships in Science and Engineering (WISE)

I have applied for the DAAD scholarship programme "Working Internships in Science and Engineering". The details are as following:

DAAD Application Number: 57460839 / 94 F8D14D6C1

Internship period: 10/05/2019 – 31/07/2019

German Host University: Universität Paderborn

Applicants' details:

Name: Suyash Mahar

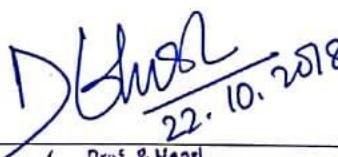
Address of the Indian University: IIT Roorkee, Roorkee, Haridwar, Uttarakhand – 247667

Mobile: +91-7579106878

Email: suyash12mahar@outlook.com

This is to certify that the above mentioned applicant is a registered student of B.tech/ Dual Degree/ Integrated programme at our Institution and has applied for the WISE scholarship with our full knowledge. If selected, the Institution will permit the student to pursue his/her internship in Germany for the said period.

Remarks if, any



Prof. & Head
Dept. of Electronics & Communication Engg.
Indian Institute of Technology Roorkee
Date, signature and stamp of Head of the Department/ Dean
Roorkee-247667, India



Electrical & Computer
ENGINEERING

5000 Forbes Avenue
Hammerschlag Hall
Pittsburgh, PA 15213-3890
www.ece.cmu.edu

July 31, 2018

To Whom It May Concern:

This letter is to confirm Suyash Mahar completion of the 2018 Summer Undergraduate Internship Program in the Department of Electrical and Computer Engineering (ECE) at Carnegie Mellon University (CMU). There are no CMU credits associated with this summer program. Completion is based on attendance and participation and does not guarantee admittance into a CMU or ECE academic program.

Suyash participated in the internship program from 5/21/2018 to 7/30/2018 in the research areas of energy-efficient mechanisms for DRAM under the supervision of System Scientist, Saugata Ghose. Questions regarding the program may be directed to Ms. Donna Frost, ECE Summer Undergraduate Internship Coordinator and International Scholar Coordinator, dfrost@andrew.cmu.edu.

Sincerely

A handwritten signature in blue ink, appearing to read "Donna Frost".

Donna Frost
International Scholar and Summer Internship Coordinator

To whomever it may concern

**at the German embassy in India and
at the German Academic Exchange
Service (DAAD)**

Chairman of the Board and
Managing Director
Prof. Dr. Christian Plessl

Warburger Str. 100
33098 Paderborn
Raum 02.167
Fon +49 5251 60-5399
Fax +49 5251 60-1714
Mail christian.plessl@upb.de
Web www.upb.de/pc2

October 15, 2018

INVITATION LETTER OF Mr. SUYASH MAHAR

This letter is to confirm that we accept the Bachelor Student **Mr. Suyash** from "**Indian Institute of Technology Roorkee**" (India) as a research intern from **10th May to 31th July, 2019** at the Paderborn Center for Parallel Computing at the University of Paderborn, Paderborn, Germany.

All the expenses of the internship are of the responsibility of Mr. Suyash.

We strongly support Mr. Suyash in his Visa and DAAD applications and looking forward to joining our institute.



(Prof. Dr. Christian Plessl)

Approval Form by German Host (Head of the Department)
 WISE – Working Internships in Science and Engineering

I would like to involve an Indian student in my research work for the following time period:

Internship period: 10-May-2019 to 31-July-2019

German Supervisor:

Name: Prof. Dr. Christian Plessl

University/ Research Institution Paderborn University /

Paderborn Center for Parallel Computing

Address: Warburger Str. 100

Telephone & Fax +49 5251 60-5399

Email: christian.plessl@uni-paderborn.de

Student Applicant:

Name Suyash Mahar

Address: F-159, Ravindra Bhawan, IIT Roorkee, Roorkee, India – 247667

Telephone +91-7579106878

Email: suyash12mahar@outlook.com

Subject/Specialization: Computer Architecture and Engineering

Title of the research project: Energy-efficient computing with FPGAs

Brief description of the research project (including notes on the experimental techniques used and possible tasks to be assigned to the research assistant):

A key research area in my group is the development of new methods for energy-efficient computing using FPGAs as accelerators. One specific area, where Suyash is expected to contribute is the implementation of low-precision linear algebra operations (approximate computing). His work will be embedded in an ongoing research project on approximate computing. He will collaborate with two of my experienced researchers (Michael Lass and Dr. Tobias Kenter). The specific task and working areas for Suyash include: 1) development of FPGA accelerators for low-precision linear algebra using OpenCL high-level synthesis, 2) synthesizing and optimizing the accelerators, 3) measuring performance and energy-consumption, 4) comparison with CPU, 5) presenting the results in our research seminar.

Is practical experience necessary? X Yes _____ No

Which other conditions does the applicant have to fulfill?

What knowledge of German is mandatory for the research internship(s)?

good fair poor X none Paderborn Center for Parallel Computing
Universität Paderborn
D-33095 Paderborn / Germany

Date, signature of the German Host (Head of the department)

- Description of the research project can be mentioned either in the approval form or in the invitation letter