

# AnkitJain

## Contact

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## Skills

### Microfluidics

Droplet microfluidics  
Continuous-flow microfluidics  
Quake-Valves  
On-chip electrodes  
Impedence-based detection

### Devices

CAD Designs  
Photolithography  
Mask Alignment  
Soft Lithography  
3D Printing

### Optics

Fluorescence detection  
Photothermal detection  
Fluorescence Imaging  
Laser-optics

### Biology/Biochemistry

Cell Culture  
Enzyme Kinetics

### Electronics

Architecture design  
Board design  
FPGA development  
Microcontrollers

### Programming

Matlab  
LabVIEW  
Python  
C/C++  
Verilog HDL

### Software Tools

AutoCAD  
Solidworks  
Comsol Multiphysics

### Languages

English  
German (B1)  
Hindi

## Experience

### deMello group, ETH Zurich

Doctoral Candidate

Zurich, CH; Jan 2018 – Present

- Conception and development of novel high-throughput absorbance-activated droplet sorting (AADS) platform.
- Ultra high-throughput screening and sorting of enzyme libraries in microfluidic droplets using fluorescence/absorbance detection.
- Design and development of deformability-based cell sorting platform.
- Workflow automation using LabVIEW, Python and MATLAB.
- SU-8 based-device fabrication in the cleanroom.

### Juniper Networks

Hardware Engineer

Bangalore, IND; Aug 2013 – Aug 2015

- Ownership of high quality hardware from concept to production.
- Design and verification of control path FPGA.
- Design and testing of high speed PCBs.
- Collaboration with PCB layout, Mechanical, Software, Testing and Manufacturing teams.

### National Instruments

Application Engineer Intern

Bangalore, IND; Jun 2009 – Jul 2009

- Design and verification of FPGA on PXI systems.
- Real-time signal processing using LabVIEW.

## Education

### Doctoral Candidate

ETH Zurich, CH  
Chemical Engineering  
Jan 2018 - Present

### Master of Science

ETH Zurich, CH  
Micro- and Nanosystems  
Sep 2015 - Dec 2017  
GPA: 5.55/6

### Bachelor of Technology

IIIT Allahabad, IND  
Electronics and Communication  
Aug 2009 - Jun 2013  
GPA: 9.36/10

## Projects

### Microfluidics

#### High-throughput screening of enzyme libraries

Prof. Andrew deMello, ETH Zurich

Jan 2019 – Present

Screening of Haloalkane dehalogenase and Uronate dehydrogenase enzyme libraries for directed evolution experiments in droplet microfluidics using a fluorescence-activated droplet sorting platform.

#### Design and development of a novel Absorbance-activated droplet sorting (AADS) platform

Prof. Andrew deMello, ETH Zurich

Oct 2020 – Present

Developing the fastest AADS platform published to date for directed evolution applications.

#### Design and development of a high-throughput cell-deformability-based sorting platform

Prof. Andrew deMello, ETH Zurich

Aug 2021 – Present

Electrically actuated cell-sorting platform based on cell-deformability in a non-newtonian viscoelastic fluid.

#### On-demand digital barcodes in droplets

Prof. Andrew deMello, ETH Zurich

Mar 2017 – Dec 2017

Generation of on-demand monomer droplets, photo-polymerization and subsequent loading into an encapsulating droplet for barcoding applications

#### Microfluidic platform for the large-scale screening of *C. elegans*

Prof. Andrew deMello, ETH Zurich

Apr, 2016 – Jul, 2016

Developed an image-based automated platform for worm loading, trapping using on-chip pneumatic valves and worm release.

## MEMS fabrication & characterization

### Fabrication and characterization of MEMS acoustic sensors

Prof. Christofer Hierold, ETH Zurich

Feb, 2016 – Aug, 2016

Aided in the development of coupled mass-based MEMS acoustic sensors. The tasks included design of test structures, etching (RIE) of devices, imaging using SEM, and characterization via Laser Doppler Vibrometer.

### Fabrication and characterization of a MEMS accelerometer

Embedded MEMS Lab (Practical Course), ETH Zurich

Oct, 2015 – Nov, 2015

## Board design & verification

### Design of 4X100GE CXP optics based physical interface card

Juniper Networks, Bangalore

Sep, 2013 – Jul, 2015

Designed and tested a high-speed PCB that housed four 100GE CXP optical interfaces, Regenerative repeaters (retimers), a control path FPGA, and associated clocking, power and miscellaneous control devices.

### Qualification of 48 port 10 GE interface test module

Juniper Networks, Bangalore

Apr, 2013 – Jun, 2013

Tested PCB which was used for validating various types of interfaces such as 10GE, I2C, SGMII, PCIe and MDIO. The board housed regenerative repeaters for looping back 10GE traffic, control path CPLD, and various power loads.

## FPGA design

### Implementation of a JPEG encoder on FPGA

Prof. Dr. Neteesh Purohit, IIITA

Jan, 2012 – May, 2012

Developed and implemented an efficient architecture for JPEG image compression encoder with a 2-stage pipeline without using any hardware multipliers (just for fun).

## Publications and Conferences

Pietro Binel, **Ankit Jain**, Anna Jaeggi, Daniel Biri, Ashwin Kumar Rajagopalan, Andrew J. deMello and Marco Mazzotti; *Estimating the Three Characteristic Lengths of Plate-like Particles in Suspension*; 2021 AIChE Annual Meeting

**Ankit Jain**, Gerassimos Kolaitis et al; (In preparation; equal contribution)

## Awards

ETH Scholarship 2017

Juniper Networks Hardware Engineering Spot Award 2015

IIIT-Allahabad Academic Excellence Award (2nd highest GPA) 2010

President's Scout (by the President of India) 2007

## Extracurricular Activities

**Cofounder and President**, SKY Campus at ETH Present

**Vice President**, Indian Student Association Zurich Present

**Co-organizer**, Summer School in Micro and Optical Technologies in Biomedical Science, Fiesch, Switzerland 2018

**Slammer**, Science Slam Zurich 2019