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Interests

- Human-Computer Interaction (HCI), Nano-materials and Nanofabrication, Soft Robotics, Microfluidics, Instrumentation, Graphene and its derivatives, Interaction Design. Anthropology, Psychology.

Education

INDIAN INSTITUTE OF TECHNOLOGY (IIT), ROORKEE | INTEGRATED M. Sc. (Physics) | 2013-18 (EXPECTED MAY 2018)

- Specialization in *Material Science (Condensed Matter Physics)* and *Nanofabrication*.
- Pursuing an interdisciplinary Master's Thesis in collaboration with Saarland University, Saarbrücken, Germany: Supervisors:- *Prof. Jürgen Steimle*, (Saarland University) and *Dr. Soumitra Satapathi* (IIT Roorkee).

SAARLAND UNIVERSITY | MASTER'S THESIS | DEC 2017 ONWARDS

- Supervised by Prof. Jürgen Steimle, at the Human-Computer Interaction Group in Saarland Informatics Campus, Saarbrücken, Germany.
- Working towards interdisciplinary master's thesis at the interface of HCI and Material Science.

BAUHAUS-UNIVERSITÄT WEIMAR, GERMANY | RESEARCH INTERNSHIP | MAY 2017-JUL. 2017

- Supervised by Prof. Eva Hornecker, Human-Computer Interaction Chair at Bauhaus-Universität Weimar.
- Worked on shape-changing soft robotic TUIs (Tangible User Interfaces) and ultrasonic sensing.

SENIOR SECONDARY SCHOOL (10+2) | 2013 | CBSE

Major in Mathematics, Physics, Chemistry, Fine Arts;

Professional & Research Experience

CO-FOUNDER & PRESIDENT | DESIGN STUDIO, IIT ROORKEE | SEPT. 2016-APR. 2017

- Design Studio, IIT Roorkee is a multidisciplinary studio at Indian Institute of Technology, Roorkee dedicated to design-oriented research and product development with a stronghold in Human-Computer Interaction, Augmented Reality, Product Design, Game development, Animation and Graphics etc. (<https://designstudio.cc/>). I co-founded the group and lead it from its inception as the Founding President.
- Personal projects on soft pneumatic valves, mechanics of origami patterns and shape-changing interfaces (details on online portfolio).

CO-FOUNDER & TECH LEAD | LOG 9 MATERIALS | SEPT. 2015-OCT.2016

- Log 9 Materials is an Indian startup aiming at the commercial applications of lab-scale graphene nanotechnology and manufacturing high-quality nano-materials (primarily graphene). (www.log9materials.com). As Tech Lead my responsibilities were to look after the overall Research and Development, Innovation, Device Design & Fabrication.
- Designed and fabricated a Graphene Quantum Dots (GQD) based LED and graphene-based multi-action water purification system.
- Designed and developed PPUF - a graphene-ceramic composite based cigarette filter which lowers the carcinogens in cigarette smoke by 50-60 % (www.ppuuf.co.in).

UNDERGRADUATE RESEARCHER | SATAPATHI LAB, IIT ROORKEE | MAY. 2015-NOV. 2017 (With an interim break for startup)

- Worked on a variety of projects in instrumentation, nanofabrication, microfluidics, additive manufacturing, organic electronics and biomaterials under the supervision of *Dr. Soumitra Satapathi*, Asst. Professor, Dept. of Physics, IIT Roorkee. (<http://satathilab.com/>)

FREELANCE USER INTERFACE & EXPERIENCE DESIGNER | DEC. 2013-MAY. 2015

- Managed a wide variety of cross-media projects involving branding, illustrations, animations, products, UI-UX design, and development for startups (Inst-E-Shop, AAYUU.com, to name a few) as well as industry leaders.

Publications

- “*Graphene-Based 3D Xerogel as Adsorbent for Removal of Heavy Metal Ions from Industrial Wastewater*”, **Purnendu**, Soumitra Satapathi, 5, 2, 96-102, 2017, Journal of Renewable Materials. ([Link](#))
- “*Soft Pneumatic Valve for Interaction design*”, **Purnendu**, Kristian Gohlke, Eva Hornecker [Manuscript Under Preparation].

Patents

A GRAPHENE BASED TOBACCO SMOKE FILTER AND A METHOD FOR SYNTHESIZING GRAPHENE COMPOSITION

WO 2017187453 A1 ([Link](#))

- **DEVICE AND METHOD FOR REAL-TIME THICKNESS CONTROLLED SPIN-COATING**
E-106/43/2016/DEL/201611039173 - (*pending*)

Posters

- “*Graphene-Chitosan Xerogel for Heavy Metal Ion Removal*”, **Purnendu**, Soumitra Satapathi, International Conference On Nanoscience And Technology (ICONSAT), 2016, IISER PUNE

Awards and Scholarships

- **Graduate Research Assistantship**, for PhD at ATLAS Institute, University of Colorado-Boulder, USA for four years (2018-22).
- **INSPIRE Scholarship for Higher Education (SHE)**, Department of Science and Technology (DST), Govt. of India (2013-18).

Invitations and Talks

- Special Invitee at **Make-In-India Week**, Mumbai, 13-18 Feb. 2016.
- Talk about “**Future of Graphene in manufacturing**” at the short-term program on *Make-In-India-Issues and Challenges*, NITTTR Chandigarh, 10 Nov. 2017.

Skills

- Advance skills in **Design thinking**, design **softwares** in both **2D** and **3D** (Adobe Creative Suite, Autodesk Softwares, Rhino with Grasshopper, Cinema-4D, Blender).
- Advance skills in **Nano-material fabrication and experimentation**: including microfluidic control and study, soft-lithography, photolithography, thin film deposition, nanofabrication, chemical fabrication, wet-lab techniques, different types of spectroscopy (Fluorescence, UV-Visible, FTIR), X-Ray Diffraction, Atomic Force Microscopy and Electron Microscopy (SEM, TEM, STM) and instrumentation.
- Advance skills in **macro-scale instrumentation, prototyping, and digital fabrication: 3D printing**, cutting, molding, casting; instrumentation of most digital machines to handle plastic/composite/metal/wood.
- Medium skills in software development and scientific computing: **Graphics, Animation, Interface and Machine Learning** in **MATLAB, C, Javascript, FORTRAN**.
- Medium skills in digital and analog circuit design, **signal processing, microprocessors, fast-prototyping** as well as machine building: **hardware design and assembly**.
- Basic skills in biological engineering, **bacteria culture**.
- Fluent in spoken and written **English, Hindi**, and **Maithili**-eastern Indian-subcontinent language (*mother tongue*);

Extra-Curricular Activities

- **Associate Member**, Fine Arts Section, IIT Roorkee (2013-present).
- **Lead Design Manager**, Cognizance- The Annual Technical Festival of IIT Roorkee (2015-16).
- **Designer**, Cognizance- The Annual Technical Festival of IIT Roorkee (2013-15).
- **Design Head & Additional Secretary**, Kshitij- The Official Literary Magazine of IIT Roorkee (2015-16).

References

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Prof. Dr. Ing. Eva Hornecker

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Dr. Soumitra Satapathi

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