

Roser ATLAS Center, 1125
18th St. 320 UCB, Boulder, CO 80309
www.purnendu.me

purnendu@colorado.edu
purnendu@ph.iitr.ac.in
+1 (720) 757 2680

Interests

Human-Computer Interaction (HCI), Programmable Matter, Nano-materials and Nanofabrication, Soft Robotics, Microfluidics, Personal Fabrication, Instrumentation, Graphene and its derivatives, Interaction Design.

Education

UNIVERSITY OF COLORADO BOULDER (ATLAS Institute) | PhD (Technology, Media and Society) | 2018-2022 (expected)

Interdisciplinary research at the intersection of Human-Computer Interaction and Nanotechnology. Designing interactions with programmable matter.

Co-chairs:- *Daniel Leithinger* (Computer Science and ATLAS) and *Carson Bruns* (Mechanical Engineering and ATLAS)

INDIAN INSTITUTE OF TECHNOLOGY (IIT), ROORKEE | 5 Year Integrated M. Sc. (Physics) | 2013-2018

Specialization in *Material Science (Condensed Matter Physics)* and *Nanofabrication*

Pursued an interdisciplinary Master's Thesis in collaboration with Max Planck Institute for Informatics, Saarbrücken, Germany:
Supervisors:- *Prof. Jürgen Steimle*, (Saarland University) and *Dr. Soumitra Satapathi* (IIT Roorkee).

MAX PLANCK INSTITUTE FOR INFORMATICS | MASTER'S THESIS | DEC 2017-APR 2018

Supervised by Prof. Jürgen Steimle, at the Human-Computer Interaction Group in Saarland Informatics Campus, Saarbrücken, Germany.

Title:- Acoustic Metamaterials: Towards Next Generation Programmable Matter

Professional & Research Experience

BAUHAUS UNIVERSITY, WEIMAR, GERMANY | RESEARCH INTERNSHIP | MAY 2017-JULY 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.

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

Design Studio, IIT Roorkee is a multidisciplinary studio managed by students 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.ppuF.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://satapathilab.com/>)

FREELANCE USER INTERFACE AND EXPERIENCE DESIGNER | ROORKEE | 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](#))

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

Daniel Leithinger

Assistant Professor
Department of Computer Science
and ATLAS Institute.
University of Colorado Boulder
1125 18th St. 320 UCB Boulder, CO
80309

E-Mail: daniel.leithinger@colorado.edu

Homepage: [https://www.colorado.edu/
atlas/daniel-leithinger](https://www.colorado.edu/atlas/daniel-leithinger)

Mark D. Gross

Director ATLAS Institute & Professor
Department of Computer Science
and ATLAS Institute.
University of Colorado Boulder
1125 18th St. 320 UCB Boulder, CO
80309

E-Mail: mdgross@colorado.edu

Homepage: <http://mdgross.net/>

Carson Bruns

Assistant Professor,
Department of Mechanical Engineering
and ATLAS Institute.
University of Colorado Boulder
1125 18th St. 320 UCB Boulder, CO
80309

E-Mail: carson.bruns@colorado.edu

Homepage: [https://www.colorado.edu/
atlas/carson-bruns](https://www.colorado.edu/atlas/carson-bruns)