

EDUCATION

- 2017-2023 (expected) **Doctor of Philosophy**
School of Information, University of Texas at Austin, USA
Areas: Searching as Learning (SAL), Interactive Information Retrieval, Human-AI Partnership
Advisor: Dr. Jacek Gwizdka
- 2011-2015 **Bachelor of Engineering (Computer Science & Technology)**
Indian Institute of Engineering Science and Technology (IIST) Shibpur, India
GPA 8.85 / 10.00 (First Class with Honours)

SKILLS

- Machine Learning:** Keras, TensorFlow, Gensim, Spacy, Python, Scikit-learn, NumPy, SciPy, Pandas
- Web development:** WebExtensions, PHP, Java, ASP.NET, WordPress, Bootstrap, HTML, CSS, JavaScript, jQuery
- Visualization:** Highcharts.js, Matplotlib, Google Maps JavaScript API
- Database:** MySQL, Oracle, PL/SQL, Microsoft SQL Server
- Experimental Design:** eye-tracking user studies, iMotions biometric platform, Qualtrics Survey
- Quantitative Research:** eye-tracking data analysis, crowdsourcing, statistical hypothesis testing

RESEARCH PROJECTS

- 01.2018-Present **SAL: Search as Learning**
- **Dissertation research:** longitudinal study to correlate knowledge-gain with search-behaviour
 - **Prior work:** Analysed **eye-tracking** data, **search-interactions**, and **word embeddings**, to measure how much users learn (gain new knowledge) when searching for information online.
 - **Publications:** [SIGIR'21](#) [DE1]; [CHIIR'21](#) [DC1, WP2]; [CIKM'20](#) [WP1]; [CHIIR'19](#) [C4]; [ETRA'18](#) [C3];
 - *WordPress Plugin, WebExtensions API, Python, TensorFlow Hub, word2vec, GloVe, Gensim, Spacy, MySQL, Stata, Highcharts.js*
- 01.2018-06.2019 **Crowdsourcing & Visualizing large datasets for Computer Vision & Deep Learning**
- Developed and delivered a **pipeline** for **crowdsourcing**, storing, and **visualizing** annotations for large-scale **Computer Vision** and **NLP datasets** for **Human-Computer Interaction (HCI)**
 - Delivered **3 annotated datasets** for **~40,000 images** each
 - Delivered visualization tool: vizwiz.org/browse
 - **Publications:** [CSCW'20](#) (**Honourable Mention Award**) [C10]; [ECCV'20](#) [C9]; [ICCV'19](#) [C6];
 - *Crowdsourcing (Amazon Mechanical Turk), MySQL, Python, PHP, HTML, CSS, jQuery, Bootstrap*
- 08.2018-Present **PCDE: Personalized Complex Data Exploration**
- Proposed novel **eye-movement analysis** technique: **scanpath-image classification** using semi-**interpretable convolutional neural networks (CNN)**
 - Predicted **relevance** of news-articles for answering factual questions, from **eye-tracking** data
 - Developed visualization tool: volt.ischool.utexas.edu/viz/pcde_scanpaths.php
 - **Publications:** [ETRA'20](#) [C8]; [CHIIR'20](#) [C7]
 - *Keras, TensorFlow, Python, MySQL, Stata, Highcharts.js, PHP, HTML, CSS, jQuery, Bootstrap*
- 05.2018-05.2019 **EyeArt: Understanding Image Recognition in Humans**
- Designed and conducted an in-lab **eye-tracking user-study** with **30 participants**; users were asked to view and recognize distorted images of famous artworks and landmarks
- **Publication:** [ETRA'19](#) [C5] (**Best Short Paper Award**)
 - *Eye-tracking study, stimuli-design, participant-recruitment*

INDUSTRY EXPERIENCE

- 05.2018-08.2018 **QuoData GmbH, Berlin, Germany**
- Summer Research Intern – DAAD RISE Program (German Academic Exchange Service)*
- Classified biological samples using **CNN** and **RNN** from MALDI-TOF mass-spectrometry data
 - Tested **classifier robustness** against Gaussian noise, random phase shift, and peak magnification
 - *Keras, TensorFlow, Python, Scikit-learn, Matplotlib, NumPy, SciPy, Pandas*

- 07.2015- **Calcutta Electric Supply Corporation (CESC) Limited, Kolkata, India**
 07.2017 *Software Engineer for Web-applications; Database Programmer*
- Designed and developed web-based tools for process-management and financial-reporting
- 05.2014- *Summer Intern*
 07.2014
- Designed and developed a **real-time web-application** to monitor timely delivery of electricity bills, which processes data for 1.1 million consumers daily
 - Won **Best Internship Project Award** (Details: <https://nilavra.in/projects/cms>)
 - *Java, Oracle, PL/SQL, HTML, CSS, JavaScript, jQuery, Bootstrap, Highcharts.js*
- 06.2013- **Oil and Natural Gas Corporation (ONGC) Ltd., Kolkata, India**
 07.2013 *Summer Intern, Web-application Development*
- Developed a web-app for plotting oil-well lithology logs, and performing data-warehousing
 - *ASP.NET C#, MS SQL Server, HTML, CSS, jQuery, Bootstrap*

TEACHING EXPERIENCE

- 08.2020- **University of Texas at Austin, School of Information**
 12.2020 *Teaching Assistant – Quantifying User Experience (online course)*
- Helping to design and teach a Statistics course (descriptive & inferential) for UX

FREELANCE WEB-DEVELOPMENT EXPERIENCE

- 2017 **Snaxchange Limited, London, UK** details: nilavra.in/projects/snaxchange
- Designed and developed a **multi-vendor eCommerce platform** to help reduce food wastage
 - *WordPress, WooCommerce, PHP, MySQL*
- 2015 **Abin Design Studio, Kolkata, India** details: nilavra.in/projects/abin-design-studio
- Designed and developed a **responsive web-portfolio** for a prominent architect, featuring an intuitive image-based drag-and-drop content management system built from scratch

PUBLICATIONS [[Google Scholar Link](#)]

First-author: **10** • Awards: **3** • h-index: **5** • i10-index: **5** • Citations: **111**

Conference Papers

- [C10] Zheng X., Wang Y., Chiu T., **Bhattacharya N.**, & Gurari D. (2020) Vision Skills Needed to Answer Visual Questions. *ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW '20)*. DOI: [10.1145/1122445.1122456](https://doi.org/10.1145/1122445.1122456). (Top 5% from 1,000+ submitted papers) **Best Paper Honourable Mention Award**.
- [C9] Gurari D., Zhao Y., Zhang M., & **Bhattacharya N.** (2020) Captioning Images Taken by People Who Are Blind. *European Conference on Computer Vision (ECCV '20)*. (1361/5025 = 27.1% acceptance rate)
- [C8] **Bhattacharya N.**, Rakshit R., & Gwizdka J. (2020). Towards Real-time Webpage Relevance Prediction Using Convex Hull Based Eye-tracking Features. *ACM Symposium on Eye Tracking Research and Applications (ETRA '20 ETWEB)*. DOI: [10.1145/3379157.3391302](https://doi.org/10.1145/3379157.3391302)
- [C7] **Bhattacharya N.**, Rakshit R., Gwizdka J., & Kogut P. (2020). Relevance Prediction from Eye-movements Using Semi-interpretable Convolutional Neural Networks. *ACM Conference on Human Information Interaction and Retrieval (CHIIR '20)*. DOI: [10.1145/3343413.3377960](https://doi.org/10.1145/3343413.3377960)
- [C6] **Bhattacharya N.**, Li Q., & Gurari D. (2019). Why Does a Visual Question Have Different Answers? In *IEEE International Conference on Computer Vision (ICCV '19)*. [CVF Open Access](#). (1077/4303 = 25% acceptance rate)
- [C5] Ebeid I. A., **Bhattacharya N.**, Gwizdka J., & Sarkar A. (2019). Analyzing Gaze Transition Behavior Using Bayesian Mixed Effects Markov Models. *ACM Symposium on Eye Tracking Research and Applications (ETRA '19)*. DOI: [10.1145/3314111.3319839](https://doi.org/10.1145/3314111.3319839). **Best Short Paper Award**.
- [C4] **Bhattacharya N.**, & Gwizdka J. (2019). Measuring Learning During Search: Differences in Interactions, Eye-Gaze, and Semantic Similarity to Expert Knowledge. *ACM Conference on Human Information Interaction and Retrieval (CHIIR '19)*. DOI: [10.1145/3295750.3298926](https://doi.org/10.1145/3295750.3298926)
- [C3] **Bhattacharya N.**, & Gwizdka J. (2018). Relating Eye-Tracking Measures With Changes In Knowledge on Search Tasks. *ACM Symposium on Eye Tracking Research and Applications (ETRA '18)*. DOI: [10.1145/3204493.3204579](https://doi.org/10.1145/3204493.3204579)
- [C2] Roy S., **Bhattacharya N.**, Chanda B., Chaudhuri B., & Banerjee S. (2017). Image Denoising Using Fractal Hierarchical Classification. *Annual Convention of Computer Society of India (CSI '17)*. DOI: [10.1007/978-981-13-1343-1_52](https://doi.org/10.1007/978-981-13-1343-1_52). **Best Paper Runner-Up Award**.

- [C1] **Bhattacharya N.**, Roy S., Nandi U., & Banerjee S. (2015). Fractal Image Compression using Hierarchical Classification of Sub-images. *International Conference on Computer Vision Theory and Applications (VISIGRAPP '15)*. DOI: [10.5220/0005265900460053](https://doi.org/10.5220/0005265900460053)

Workshop Papers (Peer Reviewed)

- [WP2] **Bhattacharya N.**, & Gwizdka J. (2021). A Triangulation Perspective for Search as Learning. *Proceedings of the CIKM 2021 Workshop: 2nd International Workshop on Investigating Learning During Web Search (IWILDS, CIKM '21)*.
- [WP1] **Bhattacharya N.**, & Gwizdka J. (2020). Visualizing and Quantifying Vocabulary Learning During Search. *Proceedings of the CIKM 2020 Workshop: 1st International Workshop on Investigating Learning During Web Search (IWILDS, CIKM '20)*.

Demo Papers (Peer Reviewed)

- [DE1] **Bhattacharya N.** & Gwizdka J. (2021). YASBIL: Yet Another Search Behaviour (and) Interaction Logger. *ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR '21)*. DOI: [10.1145/3404835.3462800](https://doi.org/10.1145/3404835.3462800)

Doctoral Consortium (Peer Reviewed)

- [DC1] **Bhattacharya N.** (2021). A Longitudinal Study to Understand Learning During Search. *ACM Conference on Human Information Interaction and Retrieval (CHIIR '21)*. DOI: [10.1145/3406522.3446009](https://doi.org/10.1145/3406522.3446009)

AWARDS, HONOURS & FELLOWSHIPS

ACM SIGIR Student Travel Grant

- 2021: For presenting [DE1] at SIGIR 2021, online due to COVID-19
 2021: For presenting [DC1] at CHIIR 2021, online due to COVID-19
 2020: USD 1000 for presenting [C7] at CHIIR 2020, Vancouver, BC, Canada (online due to COVID-19)
 2019: USD 1000 for presenting [C4] at CHIIR 2019, Glasgow, Scotland, UK

ACM SIGCHI Student Travel Grant

- 2020: USD 1800 for presenting [C9] at ETRA 2020, Stuttgart, Germany (conference cancelled due to COVID-19)

- 2020 **2020-21 University Continuing Fellowship**, *University of Texas at Austin – Graduate School*
- 2019 **Summer 2019 Fellowship**, *University of Texas at Austin – Graduate School*
- 2018 **DAAD RISE Professional Scholarship**, *German Academic Exchange Service (DAAD)*
- 2017 **Graduate Recruitment Fellowship**, *University of Texas at Austin – Graduate School*
- 2017 **UDAAN Employee Certificate of Recognition**, *CESC Limited, Kolkata, India*
 Employee Appreciation Award, amongst ~30 employees in the department (top 3%)
- 2017 **Runner up, Smart India (National) Hackathon**, *Govt. of India*
 Led (mentored) a team of six students in a national hackathon.
- 2016 **Best Website Design, WebD Web Development Contest**, *IIST Shibpur, India*
 Among 25 participants nationwide, for designing a college cafeteria website (top 4%)
- 2015 **AICTE-INAE Travel Grant for Engineering Students**, *Govt. of India*
 INR 100,000 (~USD 1500) for presenting [C1] at VISAPP 2015, Berlin, Germany
- 2015 **Winner, WebD Web Development Contest**, *IIST Shibpur, India*
 Among 20 participants nationwide, for designing a university library website (top 5%)
- 2014 **Best Internship Project Award**, *CESC Limited, Kolkata, India*
 Among 15 interns, for designing Bill Delivery Monitoring System (top 6%)

SERVICE

Conference / Workshop Program Committee

- 2021 *Student Volunteer – Pre-Conference Scheduling* **ACM CSCW 2021**
- 2021 *From the Margins to the Centre: Defining New Mission and Vision for HCI Researchers in South Asia* workshop co-located with **ACM CHI 2021**

Peer Reviewing

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|-----------------------|---------------------------------------------------------------------------------|
| IWILDS | <i>CIKM Workshop on Learning during Search</i> , 2021 |
| IP&M | <i>Information Processing and Management</i> , Elsevier, 2021 |
| JLIS | <i>Journal of Librarianship and Information Science</i> , SAGE, 2021 |
| IndiaHCI | <i>India HCI Professional Association Conference (ACM ICPS)</i> , 2020 |
| IWC | <i>Interacting with Computers</i> , Oxford University Press, 2020 |
| Neurocomputing | <i>Journal on Neural Networks and Machine Learning</i> , Elsevier, 2020 |
| JASIST | <i>Journal of the Association for Information Science and Technology</i> , 2019 |

CHIIR *ACM SIGIR Conference on Human Information Interaction and Retrieval*, 2019
ETRA *ACM Symposium on Eye Tracking Research & Applications*, 2018-2020

Voluntary Initiatives as Web-manager of Research-groups

2020-Present Web manager: *HCI for South Asia* Research Community (hci4south.asia)
2019-Present Web manager: *Information eXperience (IX) Lab* (ixlab.ischool.utexas.edu)
2019-Present Web manager: *VizWiz* project (vizwiz.org)

School and University Committees Member

2020-21 UT Austin iSchool Faculty Search Committee: Bowden Endowed Professorship
2018-19 UT Austin iSchool Faculty Search Committee: Assistant Professor
2017-18 UT Austin iSchool Doctoral Students Association
2017-18 UT Austin iSchool Web Committee

External Volunteering

2021-22 **Texas Ballroom**: web-manager at texasballroom.org
2020-21 **Latinitas Code Chica '21**: co-planning updated syllabus and curriculum for advanced version of event
07.2020 **Latinitas Future Chica '20**: co-mentored 3 schoolgirls for a 60-minute design-thinking activity online
06.2020 **Latinitas Code Chica '20**: co-taught HTML-CSS based web development to a class of 14 schoolgirls
06.2020 **SIGCHI Student Chapter Mentorship Clinic**: mentored researchers for HCI projects from India

AFFILIATIONS

IEEE Institute of Electrical and Electronics Engineers, since 2016
ACM Association for Computing Machinery, since 2018

LANGUAGES Fluent English and Bengali, Knowledge of Hindi

OTHER ACTIVITIES Photography, Video editing (nilavra.in/archive); Music direction