Nilavra Bhattacharya

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EDUCATION

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

SKILLS

UX / User Research: *eye-tracking lab studies, remote and longitudinal studies, crowdsourcing studies*

Web development: *Browser Extension, PHP, Java, ASP.NET C#, WordPress, Bootstrap, HTML, CSS, JavaScript, jQuery*

Dashboards & Data Visualization: *Plotly Dash, Streamlit, Highcharts.js, Matplotlib*

Database: *MySQL, Oracle, PL/SQL, Microsoft SQL Server*

Machine Learning & Big Data Analysis: *Python, Keras, TensorFlow, Scikit-learn, NumPy, Pandas*

Quantitative Research Methods: *statistical analyses, hypotheses testing, Stata software, Qualtrics Surveys*

RESEARCH PROJECTS

2018.01-Present	**Search as Learning, Interactive Information Retrieval** • **Dissertation research:** longitudinal study to correlate search-behaviour with knowledge-gain (ASIS&T 2022 Doctoral Dissertation Proposal Scholarship Award for the most outstanding proposal) • **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. • Developed **browser extension** for ethically logging and syncing browsing data: GitHub link • **Publications:** SIGIR'21 [DE1]; CHIIR'21 [DC1]; CIKM [WP2]; CHIIR'19 [C4]; ETRA'18 [C3]; • *Browser Extension, WordPress Plugin, Python, Scikit-learn, word embeddings, MySQL, Highcharts.js*
2018.01-2019.06	**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*
2018.08-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 **data-visualization** tools: link to eye-tracking-viz; link to knowledge-viz • **Publications:** ETRA'20 [C8]; CHIIR'20 [C7] • *Keras, TensorFlow, Python, MySQL, Stata, Highcharts.js, PHP, HTML, CSS, jQuery, Bootstrap*
2018.05-2019.05	**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 EXPERIENCES

2022.06-2022.09 **ABB Corporate Research Centre, Germany**
Summer Research Intern – DAAD RISE Program (German Academic Exchange Service)

- Explainable AI (XAI) for Industry 4.0: Developed an **end-to-end Automated Machine Learning (AutoML) pipeline**, which is interactive and explainable (XAI) for a wide range of **industry stakeholders**: domain experts (process engineers), industrial workers (plant operators), and data scientists (model developers)
- **Collaborated** in a **design thinking workshop** with AI use-case providers, AI vendors, and research stakeholders from the fields of machine learning, XAI, user experience, and human factors
- Project website: https://explain-project.eu
- *MLOps, Design Thinking, Plotly Dash, Python, Scikit-learn, Matplotlib, NumPy, SciPy, Pandas*

2018.05-2018.08 **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*

2015.07-2017.07 **Calcutta Electric Supply Corporation (CESC) Limited, Kolkata, India**
Software Engineer for Web-applications; Database Programmer

- Designed and developed web-applications for financial reporting and process-management

2014.05-2014.07 *Summer Intern* (Best Internship Project Award)

- Designed and developed a near **real-time web-application** to monitor timely delivery of electricity bills, which processes data for 1.1 million consumers daily
- *Java, Oracle, PL/SQL, HTML, CSS, JavaScript, jQuery, Bootstrap, Highcharts.js*

2013.06-2013.07 **Oil and Natural Gas Corporation (ONGC) Ltd., Kolkata, India**
Summer Intern, Web-application Development

- Developed a web-application for searching and plotting lithology graphs of oil wells
- *ASP.NET C#, MS SQL Server, HTML, CSS, jQuery, Bootstrap*

TEACHING EXPERIENCE

2020.08-2020.12 **University of Texas at Austin, School of Information**
Teaching Assistant – Quantifying User Experience (online course)

- Co-designed and co-taught a Statistics course (descriptive & inferential) for UX data analysis

PUBLICATIONS [Google Scholar Link]

Paper Awards: **3** • First author: **10** • h-index: **7** • i10-index: **7** • Citations: **283**

Journal Articles

[J1] Rubin, M., **Bhattacharya, N.**, Gwizdka, J., Griffin, Z., & Telch, M. (**2021**). The influence of PTSD symptoms on selective visual attention while reading. *Cognition and Emotion*, DOI: 10.1080/02699931.2021.2016639

Conference Papers

[C12] Shi L., **Bhattacharya N.**, Das A., & Gwizdka J. (**2023**). True or false? Cognitive load when reading COVID-19 news headlines: an eye-tracking study. *ACM Conference on Human Information Interaction and Retrieval* (**CHIIR '23**). DOI: 10.1145/3576840.3578290

[C11] Shi L., **Bhattacharya N.**, Das A., Lease M., & Gwizdka J. (**2022**). The Effects of Interactive AI Design on User Behavior: An Eye-tracking Study of Fact-checking COVID-19 Claims. *ACM Conference on Human Information Interaction and Retrieval* (**CHIIR '22**). DOI: 10.1145/3498366.3505786

[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. (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**). DOI: 10.1007/978-3-030-58520-4_25. (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

[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

[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. 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

[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

[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. 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

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

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

AWARDS, HONOURS & FELLOWSHIPS

DAAD RISE Professional Scholarship – German Academic Exchange Service (DAAD)
2022: Four-month research internship at *ABB Corporate Research Centre*, Ladenburg, Germany
2018: Three-month research internship at *QuoData GmbH*, Berlin, Germany

University of Texas at Austin – Graduate School
2022: David Bruton Graduate Fellowship
2020: University Continuing Fellowship
2019: Summer Fellowship
2017: Recruitment Fellowship & Provost Supplement

ACM SIGIR Student Travel Grant
2021: For presenting [DE1] at SIGIR 2021, and [DC1] at CHIIR 2021 (both online due to COVID-19 pandemic)
2020: USD 1000 for presenting [C7] at CHIIR 2020, Vancouver, BC, Canada (online due to COVID-19 pandemic)
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)

2022   **ASIS&T Doctoral Dissertation Proposal Scholarship**, *Association for Information Science & Technology*
Recognizing the year's most outstanding doctoral dissertation proposal

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*
Mentored a team of six students in a national hackathon.

2016 **Best Website Design, WebD Web Development Contest**, *IIEST 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**, *IIEST 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%)

INVITED TALKS

2022.10 A Longitudinal study to understand Search as Learning, *FIRE Group, University of Tampere, Finland*
2022.02 Eye-tracking the Search Experience, *User Behaviour & Search Experience Course, UT Austin iSchool*
2021.12 Interactive Information Retrieval, *TIB – Leibniz Information Centre for Science and Technology, Germany*
2021.09 Conducting User Research in the iSchool IX Lab, *Advanced Usability Course, UT Austin iSchool*
2021.08 Interactive Information Retrieval, *ACM SIGCHI Mumbai Chapter Meeting*
2021.07 Study Texas, *EducationUSA Kolkata, a US Department of State Network*
2020.11 STEM Research in US Universities, *EducationUSA Kolkata*
2020.08 Post-graduate studies in the United States, *EducationUSA Kolkata*

SERVICE

Conference / Workshop Program Committee

2023 *Workshop Organizer – at* **ACM CHIIR 2023***: IWILDS 2023: 4th International Workshop on Investigating Learning During Web Search*

2023 *Website Manager –* **ACM CHIIR 2023** *Conference*

2021 *Student Volunteer – Pre-Conference Scheduling* **ACM CSCW 2021**

2021 *Student Volunteer –* **CIRCLS 2021** *by* United States **National Science Foundation RETTL** program

2021 *Workshop Organizer – at* **ACM CHI 2021**: *From the Margins to the Centre: Defining New Mission and Vision for HCI Researchers in South Asia* (co-led an international team of 17 researchers)

Peer Reviewing

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

2022-2023 Web manager: ACM CHIIR 2023 Conference (sigir.org/chiir2023)

2020-Present Web manager: *HCI for South Asia* Research Community (hci4south.asia)

2019-2023 Web manager: *Information eXperience (IX) Lab* (ixlab.ischool.utexas.edu)

2019-2021 Web manager: *VizWiz* project (vizwiz.org)

School and University Committees Member

2021-22 UT Austin iSchool Faculty Search Committee: Assistant Professor in HCI / HCDS

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

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

AFFILIATIONS

ASIS&T	Association for Information Science and Technology, since 2022
ACM	Association for Computing Machinery, since 2018
IEEE	Institute of Electrical and Electronics Engineers, since 2016

LANGUAGES	Fluent English and Bengali, Knowledge of Hindi
OTHER ACTIVITIES	Photography, Video editing (nilavra.in/archive); Music direction