

# Sayan Sarcar

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## CONTACT INFORMATION

Faculty of Library, Information & Media Science  
University of Tsukuba  
Tsukuba-shi, Ibaraki-ken  
Japan - 305-8550

<https://sayansarcar.github.io/>  
[mailtosayan@gmail.com](mailto:mailtosayan@gmail.com)  
[sayans@slis.tsukuba.ac.jp](mailto:sayans@slis.tsukuba.ac.jp)

## RESEARCH INTERESTS

Human-computer interaction, ageing and accessibility, input and interaction techniques on smartphones, multimodal text input systems, computational optimization in design

## ACADEMIC APPOINTMENT

### **Assistant Professor**

April '18 – Present

Faculty of Library, Information & Media Science, University of Tsukuba

- Teaching graduate and undergraduate students and interested in human-computer interaction and accessibility research areas.

## PREVIOUS ACADEMIC APPOINTMENTS

### **Research Associate (Postdoctoral Researcher)**

Feb '15 – Jan '18

School of Information and Center for Human-Engaged Computing  
Kochi University of Technology

- Japan Science and Technology Agency, Japan-Finland research projects within “FY2014 Strategic International Collaborative Research Program (SICORP)”
  - Project Title: User Interface Design for the Ageing Population
  - Principal Investigators: Prof. Xiangshi Ren, Kochi University of Technology and Prof. Antti Oulasvirta, Aalto University, Finland

## EDUCATION

### **Indian Institute of Technology Kharagpur, India**

Jul '08 – Aug '15

Doctor of Philosophy, School of Information Technology

Thesis Topic: *Development of Text Entry Mechanisms for Indic Languages*

### **National Institute of Technical Teachers' Training & Research Kolkata, India**

Master of Technology, Multimedia & Software Systems

Sep '05 – Aug '07

### **Government College of Engineering & Textile Technology, India**

Bachelor of Technology, Computer Science & Engineering

Jul '01 – Jun '05

## PROJECT EXPERIENCE

**Postdoctoral Research Fellow**  
**Center for Human-Engaged Computing**  
**Kochi University of Technology, Japan**  
**Sep '15 - Jan '18**

- **User Interface Design for the Ageing Population:** This project aims to design novel user interfaces for smartphones that suit to elderly peoples movement capabilities and cognitive functioning. The specific goal is to create scientific foundations for designing user interfaces for smartphones that better suit the capabilities of older adults. We develop mathematical models of user performance that predict improvements in user interface throughput and functionality. The

outcomes are interface designs that improve usability, usefulness, and help older adults avoid expensive and socially stigmatizing specialized devices. We conducted both short-term and longitudinal experiments to validate the developed ability-based interfaces with older adults having cognition and motor impairment.

**Senior Scientific Officer**  
**Sponsored Research and Industrial Consultancy**  
**Indian Institute of Technology, Kharagpur**  
**Dec '13 - Jan '15**

- **Standardization of Virtual Keyboards in Indian Languages:** Part of team designing and standardizing virtual keyboards for large and small hand-held devices to compose texts in terms of ease of use, ergonomic design speed of use, learnability, errors etc.

**Senior Project Assistant**  
**Sponsored Research and Industrial Consultancy**  
**Indian Institute of Technology, Kharagpur**  
**Dec '07 - Apr '11**

- **Development of Multimodal User Interface to Internet for Common People in India:** Part of team developing a user interface to Internet for both language and computer illiterate people through which one can interact to the Internet with three modes namely text, speech and icon.

JOURNAL  
PUBLICATIONS

Jussi P. P. Jokinen, Zhenxin Wang, **Sayan Sarcar**, Chaklam Silpasuw-anchai, and Xiangshi Ren. Adaptive Feature Guidance: Modelling Visual Search with Graphical Layouts. International Journal of Human-Computer Studies (IJHCS), Elsevier.

**Sayan Sarcar**, Jussi P. P. Jokinen, Antti Oulasvirta, Zhenxin Wang, Chaklam Silpasuw-anchai, and Xiangshi Ren. Ability-Based Optimization of Touchscreen Interactions. IEEE Pervasive Computing (Special Issue on Accessibility), Vol. 17, No. 1, 2018

Debasis Samanta, **Sayan Sarcar** and Soumalya Ghosh, An Approach to Design Virtual Keyboards for Text Composition in Indian Languages, International Journal of Human-Computer Interaction (IJHCI), Taylor & Francis, Vol. 29, No. 9, 2013

Pradipta Kumar Saha, Debasis Samanta, **Sayan Sarcar** and Manoj Kumar Sharma, Analysis of Visual Search Features, International Journal of Human Factors Modelling and Simulation, Inderscience Publishers, Vol. 3, No. 1, 2012

CONFERENCE  
PUBLICATIONS

**Sayan Sarcar**. 2019. Usability Evaluation of Dwell-free Eye Typing Techniques. 11<sup>th</sup> Indian Conference on Human Computer Interaction (India HCI '19). 1 - 3 November, 2019, Hyderabad, India (Accepted)

William Delamare, Chaklam Silpasuwanchai, **Sayan Sarcar**, Toshiaki Shiraki, and Xiangshi Ren. 2019. On Gesture Combination: An Exploration of a Solution to Augment Gesture Interaction. 2019 ACM Conference on Interactive Surfaces and Spaces (ISS '19). 11 - 13 November, 2019, Daejeon, South Korea (Accepted)

Jussi P. P. Jokinen, **Sayan Sarcar**, Antti Oulasvirta, Chaklam Silpasuwanchai, Zhenxin Wang, and Xiangshi Ren. 2017. Modelling Learning of New Keyboard Layouts. 35<sup>th</sup>

ACM CHI Conference on Human Factors in Computing Systems, ACM SIGCHI, pp: 4203-4215, 6 - 11 May, 2017, Denver, USA (**Best Paper Award**)

Manoj Kumar Sharma, **Sayan Sarcар**, Debdoot Sheet, and Prabir Kumar Biswas. 2016. Limitations with measuring performance of techniques for abnormality localization in surveillance video and how to overcome them?. 10<sup>th</sup> Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP '16). Article 75 , 8 pages. 18 - 22 December, 2016, Guwahati, India

Qinglong Wang, Xiangshi Ren, **Sayan Sarcар**, and Xiaoying Sun. 2016. EV-Pen: Leveraging Electro-vibration Haptic Feedback in Pen Interaction. 2016 ACM Conference on Interactive Surfaces and Spaces (ISS '16). pp: 57-66, 6 - 8 November, 2016, Niagara Falls, Canada (**Best Paper Award**)

**Sayan Sarcар**, Jussi Jokinen, Antti Oulasvirta, Chaklam Silpasuwanchai, Zhenxin Wang, and Xiangshi Ren. 2016. Towards Ability-Based Optimization for Aging Users. International Symposium on Interactive Technology and Ageing Populations (ITAP '16). pp: 77-86, 20 - 22 October, 2016, Kochi, Japan

Nem Khan Dim, Chaklam Silpasuwanchai, **Sayan Sarcар**, and Xiangshi Ren. 2016. Designing Mid-Air TV Gestures for Blind People Using User- and Choice-Based Elicitation Approaches. 2016 ACM Conference on Designing Interactive Systems (DIS '16). ACM SIGCHI, pp: 204 - 214, 4 - 8 June, 2016, Brisbane, Australia

Tuhin Chakraborty, **Sayan Sarcар** and Debasis Samanta, Design and Evaluation of a Dwell-free Eye Typing Technique, 32<sup>nd</sup> ACM CHI Conference on Human Factors in Computing Systems, ACM SIGCHI, pp: 1573 - 1578, 26 April - 1 May, 2014

**Sayan Sarcар** and Prateek Panwar, Eyeboard++ : An Enhanced Eye Gaze-based Text Entry System in Hindi, 5<sup>th</sup> Indian Conference on Human Computer Interaction (India HCI), ACM, pp: 354 - 363, 24 - 27 September, 2013, Bangalore, India

Manoj Kumar Sharma, Pradipta Kumar Saha, **Sayan Sarcар** and Debasis Samanta, Error Quantifying Metrics for Text Entry Systems Augmented with Word Prediction, 11<sup>th</sup> Asia Pacific Conference on Computer Human Interaction (APCHI), ACM SIGCHI, pp: 45 - 54, 24 - 27 September, 2013, Bangalore, India (**Best Student Paper Award**)

Manoj Kumar Sharma, **Sayan Sarcар**, Pradipta Kumar Saha and Debasis Samanta, Visual clue: An Approach to Predict and Highlight Next Character, 4<sup>th</sup> International Conference on Intelligent Human Computer Interaction (IHCI), IEEE, pp: 1 - 7, 27-29 December, 2012, Kharagpur, India

Debasis Samanta, Soumalya Ghosh, Somnath Dey, **Sayan Sarcар**, Manoj Kumar Sharma, Pradipta Kumar Saha and Santa Maiti, Development of Multimodal User Interfaces to Internet for Common People, 4<sup>th</sup> International Conference on Intelligent Human Computer Interaction (IHCI), IEEE, pp: 1 - 8, 27-29 December, 2012, Kharagpur, India

Prateek Panwar, **Sayan Sarcар** and Debasis Samanta, EyeBoard: A Fast and Accurate Eye Gaze-based Text Entry System, 4<sup>th</sup> International Conference on Intelligent Human Computer Interaction (IHCI), IEEE, pp: 1 - 8, 27-29 December, 2012, Kharagpur, India

Manoj Kumar Sharma, Pradipta Kumar Saha, **Sayan Sarcар** and Debasis Samanta, Accessing Dynamic Webpages in Users Languages, Students' Technology Symposium (TechSym), IEEE, pp: 262 - 267, 14-16 January, 2011, Kharagpur, India

Soumalya Ghosh, **Sayan Sarcar** and Debasis Samanta, Designing an Efficient Virtual Keyboard for Text Composition in Bengali, 3<sup>rd</sup> International Conference on Human Computer Interaction (IndiaHCI), ACM, pp: 84 - 87, 3 - 4 July, 2011, Bangalore, India

Soumalya Ghosh, **Sayan Sarcar**, Manoj Kumar Sharma and Debasis Samanta, Effective Virtual Keyboard Design with Size and Space Adaptation, Students' Technology Symposium (TechSym), IEEE, pp: 262 - 267, 3-4 April, 2010, Kharagpur, India

**Sayan Sarcar**, Soumalya Ghosh, Pradipta Kumar Saha and Debasis Samanta, Virtual Keyboard Design: State of the Arts and Research Issues, Students' Technology Symposium (TechSym), IEEE, pp: 289 - 299, 3-4 April, 2010, Kharagpur, India

NON-REFEREED  
PUBLICATIONS

**Sayan Sarcar**, Ayumu Ono, CHaklam Silpasuwanchai, Antti Oulasvirta, William Delamare, and Xiangshi Ren. 2019. Exploring Performance of Thumb Input for Pointing and Dragging Tasks in Mobile Devices. ACM Conference Extended Abstracts on Human Factors in Computing Systems (CHI '19), ACM SIGCHI, 4 - 9 May, Glasgow, UK

Chen Wang, **Sayan Sarcar**, Masaaki Kurosu, Jeffrey Bardzell, Antti Oulasvirta, Aliaksei Miniukovich, and Xiangshi Ren. 2018. Approaching Aesthetics on User Interface and Interaction Design. ACM Conference Extended Abstracts on Interactive Surfaces and Spaces (ISS '18), ACM SIGCHI, 25 - 28 November, Tokyo, Japan

Zack Wilson, Helen Yin, **Sayan Sarcar**, Rock Leung, and Joanna McGrenere. 2018. Help Kiosk: An Augmented Display System to Assist Older Adults to Learn How to Use Smart Phones. 20<sup>th</sup> ACM SIGACCESS Conference on Computers and Accessibility (Poster & Demo track), ACM SIGACCESS, 22 - 24 October, Galway, Ireland

Kavous Saxlehzadeh Niksirat, **Sayan Sarcar**, Huatong Sun, Effie L-C Law, Torkil Clemmensen, Jeffrey Bardzell, Antti Oulasvirta, Chaklam Silpasuwanchai, Ann Light, and Xiangshi Ren. 2018. Approaching Engagement towards Human-Engaged Computing. 36<sup>th</sup> CHI Conference Extended Abstracts on Human Factors in Computing Systems (CHI EA '18), ACM SIGCHI, 21 - 26 April, Montreal, Canada

**Sayan Sarcar**, Cosmin Munteanu, Jussi Jokinen, Antti Oulasvirta, Neil Charness, Mark Dunlop, and Xiangshi Ren. 2018. Designing Interactions for the Ageing Populations. 36<sup>th</sup> CHI Conference Extended Abstracts on Human Factors in Computing Systems (CHI EA '18), ACM SIGCHI, 21 - 26 April, Montreal, Canada

**Sayan Sarcar**, Jussi Jokinen, Antti Oulasvirta, Xiangshi Ren, Chaklam Silpasuwanchai and Zhenxin Wang. 2017. Ability-based Optimization: Smartphone Text Entry Interface Design for Older Adults, 16<sup>th</sup> IFIP TC 13 International Conference (INTERACT), pp: 326-331, 25 - 29 September 2017, Mumbai, India

Jingxin Liu, **Sayan Sarcar**, Xiangshi Ren, Chaklam Silpasuwanchai and Zhenxin Wang, Exploring the Design Space of Smartphone Text Entry Interfaces for Elderly with Tremor, ACM Conference on Chinese CHI, June 2017, Guangzhou, China (**Best Poster Award**)

Chaklam Silpasuwanchai, Jussi P. P. Jokinen, **Sayan Sarcar**, Zhenxin Wang, Antti Oulasvirta and Xiangshi Ren, Exploring the Design Space of Text-Entry Interfaces for Aging Users, 35<sup>th</sup> ACM CHI Conference on Human Factors in Computing Systems, *Workshop on Designing Mobile Interactions for the Ageing Populations*, May 2017, Denver, USA

**Sayan Sarcar**, Cosmin Munteanu, Jussi P. P. Jokinen, Antti Oulasvirta, Chaklam Silpasuwanchai, Neil Charness, Mark Dunlop, and Xiangshi Ren. 2017. Designing Mobile Interactions for the Ageing Populations. 35<sup>th</sup> CHI Conference Extended Abstracts on Human Factors in Computing Systems (CHI EA '17), ACM SIGCHI, pp: 506-509, 6 - 11 May, 2017, Denver, USA

Neil Charness, Mark Dunlop, Cosmin Munteanu, Emma Nicol, Antti Oulasvirta, Xiangshi Ren, **Sayan Sarcar**, and Chaklam Silpasuwanchai. 2016. Rethinking Mobile Interfaces for Older Adults. 34<sup>th</sup> CHI Conference on Human Factors in Computing Systems (SIG meeting). ACM SIGCHI, pp: 1131-1134, 7 - 12 May, 2016, San Jose, USA

**Sayan Sarcar**, Ahmed Sabbir Arif and Ali Mazalek, Metrics for Bengali Text Entry Research, 33<sup>th</sup> ACM CHI Conference on Human Factors in Computing Systems, *Workshop on Workshop on Text Entry on The Edge*, April 2015, Seoul, South Korea

**Sayan Sarcar** and Prateek Panwar, EyeK: An Efficient Dwell-Free Eye Gaze-Based Text Entry System, 11<sup>th</sup> Asia Pacific Conference on Computer Human Interaction (APCHI), ACM SIGCHI, pp: 215 - 220, 24 - 27 September, 2013, Bangalore, India (**Best Poster Award**)

Pawan Patidar, Himanshu Raghuvanshi and **Sayan Sarcar**, Quickpie: An interface for Fast and Accurate Eye Gaze based Text Entry, 5<sup>th</sup> Indian Conference on Human Computer Interaction (India HCI), ACM, 24 - 27 September, 2013, Bangalore, India

#### AWARDS AND TRAVEL GRANTS

- Travel Fellowship Award to attend ACM ASSETS 2017 at Baltimore, USA
- Best Poster Award, ACM Chinese CHI 2017
- Best Paper Award (top 1% among 2400 (approx.) submissions), ACM CHI 2017
- Best Paper Award (one among 119 submissions), ACM ISS 2016
- International Travel Support from SERB, Govt. of India, to attend ACM CHI 2014 at Toronto, Canada
- Best Oral presentation Award in Research Scholars' Day 2014
- Best Student Paper and Poster Award, APCHI 2013
- Best Oral presentation Award in Research Scholars' Day 2013
- Best Poster presentation Award in Research Scholars' Day 2012

#### ADVISING AND MENTORING

Kousuke Kume, Masters. (June 2015 - March 2016) Exploring Performance of One Thumb Input using Pointing and Swiping Tasks

Hiroki Moriyama, Undergraduate. (June 2015 - March 2017) Exploring Visual Representations of Error Rates in Tapping and Swiping Tasks on Touchscreens.

Ayumu Ono, Undergraduate. (June 2016 - March 2018) Leveraging Accelerometer and Gyroscope Sensor Data to Predict Screen Touch.

Yutaro Matsuura, Undergraduate. (Jan - Dec 2019) Help Kiosk: An augmented display system to assist older adults to learn how to use smart phones.

#### TEACHING

Introduction to Informatics, and Practical Seminar for Graduate Students (Fall 2019)  
Human-Computer Interaction for Undergraduate Students (Fall 2018 & 2019)  
English for Specialized Subjects (Spring 2019)  
Human-Computer Interaction course (both Undergraduate and advanced HCI course for Masters), Software Engineering, Database Management System, Algorithms and Data Structures.

CONFERENCE  
SERVICE AND  
REVIEWING

- Associate Chair of ACM Conference on Human Factors in Computing Systems (ACM CHI 2020), Honolulu, Hawaii.
- Associate Chair of ACM ISS 2019 Conference Full paper track, Daejeon, South Korea.
- Associate Chair of INTERACT 2019 Conference Full paper track, Paphos, Cyprus.
- Associate Chair of ACM CHI 2019 Conference Late Breaking Work paper track, Glasgow, Scotland.
- Organizer of a Workshop on “Approaching Aesthetics on User Interface and Interaction Design” in ACM ISS Conference on Interactive Surfaces & Spaces, Tokyo, Japan, 2018
- Organizer of a Workshop on “Forming SIGCHI Student and Professional Chapters in India” in ACM India HCI 2018 Conference, Bengaluru, India, 2018
- General Co-chair of International Symposium on IxAP & IDHF, Qingdao, China, 2018
- Chair of a session on “Touch, Pen and Mice” in ACM CHI Conference on Human Factors in Computing Systems, Montreal, Canada, 2018
- Organizer of a Workshop on “Designing Interactions for the Ageing Populations” in ACM CHI Conference on Human Factors in Computing Systems, Montreal, Canada, 2018
- Organizer of an International Workshop on “Human-Engaged Computing” at Kochi University of Technology, Kochi, Japan, 2017
- Chair of a session on “Persuasive Technology and Rehabilitation” in 16<sup>th</sup> IFIP TC 13 International Conference (INTERACT), Mumbai, India, 2017
- Organizer of a Workshop on “Designing Mobile Interactions for the Ageing Populations” in ACM CHI Conference on Human Factors in Computing Systems, Denver, USA, 2017
- General Co-chair of International Symposium on Interactive Technology and Ageing Populations (ITAP '16), Kochi, Japan, 2016
- Organizer of a SIG meeting entitled “Rethinking Mobile Interfaces for Older Adults” in ACM CHI Conference on Human Factors in Computing Systems, San Jose, USA, 2016
- Student Volunteer in ACM CHI 2015, Seoul, South Korea
- Publication Co-chair of IEEE Students’ Technology Symposium (TechSym), Kharagpur, India, 2014
- Publication Chair of IEEE Students’ Technology Symposium (TechSym), Kharagpur, India, January 14–16, 2011
- Reviewer for Elsevier International Journal of Human-Computer Studies, IEEE Transactions on Computational Social Systems, ACM Transactions on Accessibility, CHI 2013-2015, 2017, 2018, 2019, UIST 2018-2019, IUI 2016, 2018, & 2019, MobileHCI 2017-2019, DIS 2014 & 2016-2018, BCS-HCI 2014-2016, NordiCHI 2014 & 2016-2018, ACM TVX 2016-2017, INTERACT 2017, 2019, ACM ITAP 2016, IndiaHCI 2013-2016, OZCHI 2015-2017, IEEE AIVR 2018-2019

PRESENTATION  
AND TALK

- Delivered a talk on “Designing Interfaces for the Aging Populations: Experience and Lessons Learned” at International Workshop on Human-Engaged Computing (IWHEC 2019), Kochi, Japan
- Organized and presented a One-day Workshop at ACM ISS Conference, Tokyo, Japan, November 2018
- Delivered a talk on ‘Ability based Optimization: A Case Study on Designing Touchscreen Interfaces for Older Adults’ at the University of Leicester, UK, October 2018
- Delivered a talk on ‘Ability based Optimization: A Case Study on Designing Touchscreen

Keyboard Interfaces for Older Adults’ at the University of Texas at San Antonio, USA, April 2018

- Delivered a talk on ‘Designing Smartphone Text Entry Interface for Older Adults’ at Indian Institute of Technology Hyderabad, India, March 2018
- Delivered a talk on ‘Designing Interactions for the Ageing Populations’ at Waseda University, Japan, January 2018
- Delivered a talk on ‘Model-based Optimization and its Application to Design Smartphone UIs’ at the University of Tsukuba, Japan, December 2017
- Organized and presented in the One-day Workshop at ACM CHI Conference on Human Factors in Computing Systems, Montreal, Canada, April 2018
- Organized and presented in the SIG Meeting at ACM CHI Conference on Human Factors in Computing Systems, Denver, USA, May 2016
- Delivered a talk on ‘User Interface Design for the Ageing Populations’ at Kochi University of Technology, Japan, June 2015
- Presented workshop paper in ACM CHI Conference on Human Factors in Computing Systems, Seoul, South Korea, April 2015
- Presented poster in ACM CHI Conference on Human Factors in Computing Systems, Toronto, Canada, April 2014
- Presented poster in Indian Conference on Human Computer Interaction (India HCI), Bangalore, India, September 2013
- Presented poster in Asia Pacific Conference on Computer Human Interaction, Bangalore, India, September 2013
- Presented poster in Research Scholars’ Day of School of Information Technology, January 2013
- Presented paper in Intelligent Human Computer Interaction (IHCI) Conference, IIT Kharagpur, India, December 2012
- Presented paper in IEEE Student Technology Symposium (TechSym), IIT Kharagpur, India, January 2011
- Presented paper in IEEE Student Technology Symposium (TechSym), IIT Kharagpur, India, April 2010
- Delivered talk on “Multimodal User Interface for Common People in India” in workshop on “Natural Interface Design”, IIT Kharagpur, India, June 2009

#### PROFESSIONAL AFFILIATIONS

- ACM and SIGCHI professional member
- Member, HCI Professional Association of India

#### TEACHING EXPERIENCE

##### **University of Tsukuba, Japan**

Assistant Professor, Faculty of Library, Information, and Media Science

- Instructor, English for specialized subjects, April - June 2019
- Instructor, Introduction to Informatics course, Oct - Dec 2018
- Instructor, Practical Seminar class, Oct - Dec 2018
- Instructor, Introduction to Human-Computer Interaction course, Jan - Feb 2019

##### **Kochi University of Technology, Japan**

Teaching Assistant, School of Information

- Instructor, Introduction to Human-Computer Interaction course, Nov 2015 - Feb 2016, Nov 2015 - Feb 2017
- Instructor, Advanced Human-Computer Interaction course, Nov 2015 - Feb 2016

**Indian Institute of Technology Kharagpur, India**

Teaching Assistant, School of Information Technology

- Instructor for Information System Design Laboratory, Aug 2011 - Dec 2011
- Instructor for Soft Computing Applications, January 2010 to April 2010

**Haldia Institute of Technology, Haldia, India**

Lecturer, Department of Computer Science & Engineering, Aug 2007 - Dec 2007

- Taught Software Engineering and Database Management System course

**Mallabhum Institute of Technology, Bishnupur, India**

Lecturer, Department of Computer Science & Engineering, August 2005 to July 2007

- Instructor for Algorithms and Data Structures, Software Engineering courses and Programming Lab (C & Java)

REFERENCE

Available upon request