

## Sruti Das Choudhury

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### EDUCATION

PhD	Computer Science Engineering	University of Warwick, UK	2010-2013
MTech	Computer Science & Application	University of Calcutta, INDIA	2006-2009
BTech	Information Technology	West Bengal University of Technology, INDIA	2001-2005

### POST-DOCTORAL EXPERIENCE

Post-Doctoral Research Associate, Department of Computer Science & Engineering, University of Nebraska-Lincoln, USA	2015-2016
Early-Career Research Fellow, Institute of Advanced Study, University of Warwick, U.K	2014-2015

### TEACHING APPOINTMENT

Instructor, Department of Computer Science and Engineering, Computer Vision Techniques for Plant Phenotyping (seminar course 990), University of Nebraska-Lincoln, USA.	2018
Instructor, Department of Computer Science and Engineering, Computer Vision (CSE 473/873), University of Nebraska-Lincoln, USA	2017-present
PhD Coursework Lecturer, A.K.Choudhury School of Engineering and Technology, University of Calcutta, INDIA	2017
Tutor, Taiwan Summer School, University of Warwick, UK	2014
Laboratory Demonstrator, School of Engineering, University of Warwick, UK	2010-2013
In-charge, Bachelor of Computer Application, Nopany Institute of Management Studies, West Bengal University of Technology, INDIA	2006-2008
Lecturer, Department of Information Technology, Calcutta Institute of Engineering and Management, INDIA	2005-2010

### VISITING SCIENTIST

Department of Computer Science & Engineering, Indian Statistical Institute, India Invited by: Dr. Bhargab B Bhattacharya, Chair Professor, Advanced Computing and Microelectronic Unit.	2017
School of Engineering, University of Warwick, UK. Invited by: Dr. Tardi Tjahjadi, Director of Studies.	2017
Biomedical System Engineering Laboratory, University of Calcutta, India. Invited by: Amlan Chakrabarti, Dean, Faculty of Engineering.	2017

A. K. Choudhury School of Information Technology, University of Calcutta, India. 2014  
Invited by: Amlan Chakrabarti, Dean, Faculty of Engineering.

### **EDITOR AND PROGRAM COMMITTEE MEMBER**

Guest Editor of Special issue in Advances in Multimedia 2017

“2<sup>nd</sup> IEEE International Conference on Recent Trends in Information Systems” 2016  
held in the Jadavpur University, India

“3<sup>rd</sup> International Doctoral Symposium on Applied Computation and Security Systems” 2015  
held in the University of Calcutta, India

### **TEACHING QUALIFICATION COURSE**

Certificate course: “Post Graduate Award: Introduction to Academic and Professional Practice” 2014  
Awarding body: University of Warwick, U.K (Duration: 2 years)

### **RESEARCH PRESENTATION**

#### **Oral:**

4 <sup>th</sup> International Plant Phenotyping Symposium	CIMMYT, MEXICO	2016
5 <sup>th</sup> International Controlled Environment Conference	Canberra, AUSTRALIA	2016
KDD workshop on Data Science for Food, Energy and Water	California, USA	2016

#### **Invited Talks:**

Title: “Image-based plant phenotyping analysis” 2016  
Organizer: IEEE Young Professionals, Kolkata Chapter, Jabalpur University, India

Title: “Multiscale gait analysis for human identification” 2014  
Organizer: IEEE Young Professionals, Kolkata Chapter, Jabalpur University, India

Title: “Human identification based on gait analysis” 2014  
Organizer: A.K.Choudhury School of Information Technology,  
University of Calcutta, India

#### **Poster:**

Automated Leaf Tracking using Multi-view Image Sequences of Maize Plants for Leaf-growth Monitoring, Sruti Das Choudhury, Srinidhi Bashyam, Ashok Samal, Tala Awada, Vincent Stoerger, AGU Fall Meeting, New Orleans, USA. 2017

Jane Asiyo Okalebo, Sruti Das Choudhury, Tala Awada, Andrew Suyker, David LeBauer, Maria Newcomb and Richard Ward. 2017. Application of Near-Surface Remote Sensing and computer algorithms in evaluating impacts of agroecosystem management on Zea mays (corn) phenological development in the Platte River – High Plains Aquifer Long Term Agroecosystem Research Network field sites. Annual Geophysics Union Conference, New Orleans Louisiana. 2017

- Image-based Automated Vegetative-Stage Dynamic Phenotyping Analysis of Maize Plants, Sruti Das Choudhury, Ashok Samal, AusPheno-5<sup>th</sup> International Controlled Environment Conference, Canberra, Australia. 2016
- Face recognition based household security system for the elderly citizens living alone, Sruti Das Choudhury, Chintan Mondal, Debjyoti Bagchi, 3<sup>rd</sup> International Doctoral Symposium on Applied Computation and Security Systems 2016
- Computer Vision Based Phenotyping of Panicoid Crops, Zhikai Liang, Srinidhi Bashyam, Ashok Samal, Sruti Das Choudhury, Geng Bai, Yufeng Ge, Oscar Rodriguez and James C. Schnable, North American Plant Phenotyping Network (NAPPN) Inaugural Convening Event, Purdue University, USA 2016
- Automatic Leaf Recognition using Procrustes Analysis, Digital Agriculture Spoke All-Hands Meeting hosted by Iowa State University, Ames, Iowa, USA 2015
- Automatic Leaf Recognition using Generalized Procrustes Analysis, in the Plant Science Symposium- Plant Phenomics: from pixels to traits, Nebraska Innovation Campus Conference Center, University of Nebraska-Lincoln, USA
- Gait recognition for Human Identification, Sruti Das Choudhury, Tardi Tjahjadi, Open Day at the University of Warwick, UK. 2013

## **GRANT**

- Awarded seed grant by the Midwest Big Data Spoke project in UAS, Plant Sciences, and Education for the proposed project: “Development and Dissemination of a Benchmark Dataset to Stimulate 3D Image-based Plant Phenotyping Research”. 2017  
Role: Principal Investigator.
- Awarded System Science: Planning Grant for the proposed project “A System Science approach to Sustaining Midwest Food Production and Ecosystem Services through 2050”, USA. 2017  
Role: Co-Principal Investigator.
- Awarded Seed grant for the proposal entitled “A High Throughput Phenotyping Reference Dataset for GWAS in Sorghum”, University of Nebraska-Lincoln, USA 2017  
Role: Key personnel.
- Awarded EPSRC grant for the proposal entitled “Smart Surveillance System: Multimodal Biometrics for Security and Law Enforcement”, UK 2013  
Role: Principal Investigator.

## **OTHER EMPLOYMENT**

- Warden, Union Court, off-campus managed student accommodation, 2011-2014  
University of Warwick, Leamington Spa, UK, to provide pastoral support to the students

Postgraduate ambassador, Wolfson Research Exchange, for promoting interdisciplinary research and organizing PhD networking and collaborative sandpit events 2011-2013

Open-day Assistant, School of Engineering, University of Warwick, UK 2010-2013

## **INTERNATIONAL COLLABORATION**

Project title: Image-based Plant Phenotyping Analysis 2017-present  
 Role: Principal Investigator  
 Collaborator: Tardi Tjahjadi, University of Warwick, UK

Project title: Automated diagnosis of cancerous cell detection from X-Ray/CT images 2011-present  
 Role: Co-principal Investigator  
 Collaborator: Biomedical Systems Engineering, University of Calcutta, India

## **SUMMER SCHOOL**

10<sup>th</sup> International Summer School on Biometrics, sponsored by EPSRC award, 2013  
 Alghero, Italy

## **PHD SUPERVISION**

Scholar's name: Jhilam Mukherjee 2013-2017  
 Thesis title: Automated Lung Nodule Risk Prediction Model using Radiological Images  
 University: University of Calcutta

## **SCHOLARLY ACHIEVEMENT**

Course Development: Computer Vision Techniques for Plant Phenotyping UNL, USA

Founder: Plant Vision Initiative <http://plantvision.unl.edu/>

Book Editor: Intelligent Image-based Plant Phenotyping CRC press, September, 2017

## **PUBLICATION**

### **Journal Paper:**

**S. D. Choudhury**, Jin-Gang Yu, A. Samal, "Leaf Recognition using Contour Unwrapping and Apex Alignment with Tuned Random Subspace Method", Biosystems Engineering, under second review, December, 2017.

**S. D. Choudhury**, S. Bashyam, Y. Qui, A. Samal, T. Awada, "Holistic and Component Plant Phenotyping using Visible Light Image Sequence", Plant Methods, under second review, July, 2017.

Jhilam Mukherjee, **S. D. Choudhury**, A. Chakrabarti, M. Kar, “Automatic Risk Quantification of Solitary Pulmonary Nodule from Contrast Enhanced Computed Tomography Images”, IEEE journal of Biomedical and Health Informatics, under review, 2016.

**S. D. Choudhury**, T. Tjahjadi, “Clothing and Carrying Condition Invariant Gait Recognition using Rotation Forest”, Pattern Recognition Letters, 80 (2016) 1–7.

**S. D. Choudhury**, T. Tjahjadi, “Robust View-Invariant Multiscale Gait Recognition”, Pattern Recognition, 48 (2014) 798–811.

**S. D. Choudhury**, T. Tjahjadi, “Gait Recognition Based on Shape and Motion Analysis of Silhouette Contour”, Computer Vision and Image Understanding, 117 (2013) 1770-1785.

**S. D. Choudhury**, T. Tjahjadi, “Silhouette-Based Gait Recognition using Procrustes Shape Analysis and Elliptic Fourier Descriptors”, Pattern Recognition, 45 (2012) 3414-3426.

### Peer-reviewed Conference Paper:

**S. D. Choudhury**, S. Goswami, S. Bashyam, A. Samal, T. Awada, Automated Stem Angle Determination for Temporal Plant Phenotyping Analysis, ICCV workshop on Computer Vision Problems in Plant Phenotyping, Venice, Italy, 2017.

**S. D. Choudhury**, V. Stoerger, A. Samal, J. Schanable, Z. Liang, J-G Yu, Automated Vegetative Stage Phenotyping Analysis of Maize Plants using Visible Light Images, KDD workshop on Data Science for Food, Energy and Water (DS-FEW), San Francisco, California, USA, August 2016.

**S. D. Choudhury**, Y. Guan and C.-T. Li, “Gait Recognition using Low Spatial and Temporal Resolution Videos”, IWBF, pp. 1-6, Valletta, Malta, 2014.

Y. Guan, C.-T. Li and **S. D. Choudhury**, “Robust Gait Recognition from Extremely Low Frame-Rate Videos,” in IWBF, pp. 1-4, Lisbon, Portugal, April, 2013.

### Book Chapter:

**S.D. Choudhury**, A. Samal, T. Awada, “Introduction to Image-Based Plant Phenotyping”, Intelligent Image Analysis for Plant Phenotyping, CRC press, USA, 2017.

**S. D. Choudhury**, “Holistic and Component Plant Phenotyping Analysis”, Intelligent Image Analysis for Plant Phenotyping, CRC press, USA, 2017

Srinidhi Bashyam, **S. D. Choudhury**, Bhushit Agarwal, Ashok Samal, “Imaging basics for plant phenotyping, Intelligent Image Analysis for Plant Phenotyping, CRC press, USA, 2017

T. Awada, **S. D. Choudhury**. “Physiological Phenotyping Analysis”, Intelligent Image Analysis for Plant Phenotyping, CRC press, USA, 2017

### Dataset publication:

**Panicoid Phenomap-1** for research advancements in the time series analysis of holistic and component phenotypes influenced by genotypes, 2016.

**UNL-Component Plant Phenotyping Dataset (UNL-CPPD)** with original images, ground-truths and annotated images for research advancements on component plant phenotyping of cereal crops, 2017.

### Software dissemination:

Name	Programming Language	Phenotype	Year
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Bi-angular convex-hull area ratio      OpenCV, C++      Plant rotation      2016

Plant aspect ratio      OpenCV, C++      Canopy architecture      2016

## **RESEARCH INTEREST**

Computer vision, image processing, machine learning, pattern recognition, multimodal biometrics, gait and face recognition, plant phenotyping analysis, and medical image analysis.

## **INTERDISCIPLINARY RESEARCH EXPERIENCE**

Project Title: Smart Surveillance System: Multimodal Biometrics for Security and Law Enforcement.  
 Participating Departments: School of Engineering, Computer Science, Psychology, Law, Social Studies.  
 Role: Principal investigator.  
 University: University of Warwick, UK (funded by EPSRC award).

## **SOCEITAL IMPACT OF RESEARCH**

Contribution of previous work in the UK's defence: The real-time gait recognition software developed by me based on published work has been adapted in the project funded by Defence Science and Technology Laboratory (DSTL): CDE 23057 Novel Integrated ISTAR- Video Enhancement and Automated Recognition of Human Subjects via Gait Recognition and Face Verification.

## **HONORS AND AWARDS**

1. Honorable Mention, Outstanding Postdoc Scholar, University of Nebraska–Lincoln, 2017.
2. Warwick Institute of Advanced Study Early Career Research Fellowship, round 2, 2014.
3. EPSRC fellowship for interdisciplinary research project entitled “Smart Surveillance System: Multimodal Biometrics for Security and Law Enforcement”, 2013.
4. Warwick Postgraduate Research Scholarship and Engineering Bursary, University of Warwick, 2010.
5. Gold medal for securing first position in M.Tech course, University of Calcutta, 2009.

## **Travel:**

1. Travel grant for oral presentation in 4<sup>th</sup> International Plant Phenotyping Symposium, CIMMYT, Mexico, December, 2016.
2. Postdoctoral Travel Award for oral presentation in AusPheno2016 -5<sup>th</sup> International Controlled Environment Conference, 2016.
3. Early Career Researchers Travel Award by Big Data Midwest Hub, USA 2016.
4. Travel grant for poster presentation in the “Digital Agriculture Spoke All-Hands Meeting” hosted by Iowa State University, May 2016.
5. Grant received for the Communication and Impact for Female Postdoctoral Researchers course in July/August, 2014 at Cumberland Lodge and BBC, London, 2014.

6. Travel Endowment Scholarship from the University of Calcutta for PhD study, 2010.
7. 'Summer Travel Research Fund' from the University of Warwick for the collaborative research with the University of Calcutta, India, 2014.

## **REVIEWING JOURNAL**

Computer Vision and Image Understanding, Pattern Recognition, IEEE Transactions on Pattern Analysis and Machine Intelligence, Pattern Recognition Letters

## **THESIS SUPERVISION**

Masters of Science: Project entitled "Morphological plant phenotyping analysis using visible light images", University of Nebraska-Lincoln, USA (2015-2016).

Masters of Science: Project entitled "Steganography: An art of hidden communications" using Matlab, UK. (2013-2014).

Bachelor of Technology: Projects entitled "Online Examination System" and "Online Shopping System" using J2EE architecture, INDIA (2006-2010).

Undergraduate Research: "Annotation of plant images for phenotyping using Label Me", University of Nebraska-Lincoln, USA (2017).

## **TRAINING**

Attended "Write Winning Grant Proposals" seminar, sponsored by the Office of Research and Economic Development, UNL, USA, March, 2016.

Two phase training on Lemnatec plant phenotyping system at the University of Nebraska-Lincoln, USA: phase 1-lemnatec hardware (April 7-April 11, 2015) and phase 2-Image analysis using Lemnatec (June 9-June 12, 2015).

Communication and Impact for Female Postdoctoral Researchers" course held at Cumberland Lodge and BBC, London (29<sup>th</sup> July-1<sup>st</sup> August, 2014).

Participated in the competitive collaborative sandpit event held in Wolfson Research Exchange (Dec.2012), University of Warwick and succeeded to receive EPSRC grant.

Attended "In-sessional English program: listening and speaking" at the University of Warwick.

Workshops at the University of Warwick: "Effective communication: having productive conversation", "Academic writing: grammatical accuracy, syntax", "Collaborative working and developing leadership skills", "Poster design and creation", "Flash CS4 Intermediate – Building Rich Interactive Content" , "Video Capturing and Editing Workshop" (2010-2013).

Short-term courses on "Programming in Scripting Language", "Software Engineering", "Abstract Models of Computation", "C Programming and Data Structures" in National Institute of Technical Teachers' Training and Research, Kolkata, India, (2006-2010).