Tapabrata (Rohan) Chakraborty

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Summary: I am a postdoctoral researcher at the University of Oxford working on machine learning applied to biomedical signal/image processing and analysis. I am looking for a permanent academic position involving research in computer engineering (my PhD area) and teaching in electrical engineering (my BE Hons and ME subjects).

A. EDUCATIONAL QUALIFICATIONS

1) **Doctor of Philosophy (PhD) in Computer Science (2015 - 2019)**
   - **University of Otago, NZ**

2) **Master of Engineering (ME) in Electrical Engineering (2011 - 2013)**
   - **GPA: 9.33/10 (Jadavpur University, India)**

3) **Bachelor of Engineering (BE (Hons)) in Electrical Engineering (2005 - 2009)**
   - **GPA: 8.91/10 (Jadavpur University, India)**

B. RESEARCH EXPERIENCE

1) **Post-doctoral Researcher at the University of Oxford, UK (March 2019 - present)**
   - **Research: machine learning applied to biomedical signal/image processing**
   - **Project: deep learning based explainable skin lesion classification.**
   - **Funding: EPSRC SeeBiByte Grant Programme till May 2020.**
   - **Papers submitted to IEEE Letters of Computer Society and MICCAI 2020.**

2) **PhD Research at the University of Otago, NZ (Nov 2015 to Dec 2018: 3 years)**
   - **Research on fine-grained recognition of visual data from limited samples.**
   - **Project applied to visual recognition of NZ endemic bird/butterfly species.**
   - **PhD funded by University of Otago doctoral scholarship for 3 years.**
   - **Papers published in peer-reviewed journals and conferences (6 in total).**

3) **Pre-doctoral Research at the Indian Statistical Institute (Jan 2015 to Oct 2015)**
   - **Project on content detection from administrative document images.**
   - **Collaboration with Univ. de la Rochelle, France funded by Govt. Of India.**
   - **Paper published in Asian Conference on Pattern Recognition, 2016.**
   - **Took part in teaching, lab demonstration and workshop organisation.**

4) **Masters Research at Jadavpur University, India (July 2011 to June 2013: 2 years)**
   - **1st Project on face recognition based biometrics and emotion recognition.**
   - **2nd Project on blood vessel segmentation from retinal fundus images.**
   - **Collaboration with Univ. of Muenster, Germany funded by Govt. of India.**
   - **Papers published in Elsevier and Springer journals (3 in total)**

C. TEACHING EXPERIENCE

1) **Tutor/Demonstrator at the University of Oxford, UK (Oct 2019 to present)**
   - **MATLAB coding to undergraduate class of 50 students.**
   - **Also supervised mini-projects using MATLAB and graded assignments.**

2) **Tutor/Demonstrator at the University of Otago, NZ (2016 to 2018: 4 semesters)**
   - **Python and JAVA coding to undergraduate class of 250 students.**
   - **Also helped in developing course material, invigilated and graded exams.**

3) **Guest Lecturer at Jadavpur University, India (2012 to 2014: 2 years)**
   - **Taught electrical signals and systems, circuits and control theory.**
   - **Also developed curriculum, set exam questions and graded them.**

D. INDUSTRIAL EXPERIENCE

1) **Data Scientist at High Performance Sport New Zealand (2016 to 2019: 3 years)**
   - **Analysis of NZ national Olympics sports data for Rio 2016 and Tokyo 2020.**
   - **Project leader on estimated medal likelihood using machine learning.**

2) **Assistant Executive Engineer for Government of India (2013 to 2015: 2 years)**
   - **Engineering design and budgeting of large govt. engineering projects.**
   - **Plan and execute projects in public drinking water and electricity supply.**

E. ENTREPRENEURSHIP

1) **Co-founder and Technical Director of GEIA Ltd. (2016 to 2019: 3 years)**
   - **As student in NZ started Global Environmental Impact Assessment (GEIA).**
   - **It is a B2B SaaS consultancy in the social enterprise sector in New Zealand.**
   - **It helps SMEs in NZ to become more efficient through energy audits.**
   - **As Technical Director, won Callaghan R&D innovation award, Govt. of NZ.**

F. VISITING RESEARCH

1) **Visiting Researcher at the University of Cambridge, UK (Dec 2019 to Jan 2020)**
   - **Project on transparent and trustable AI in biomedical applications.**
   - **Visit is funded by the MedIAN grant to Centre for Future of Intelligence.**

2) **Visiting Researcher at the Indian Statistical Institute (Sept 2017 to Feb 2018)**
   - **Project on deep learning based fine-grained classification of image data.**
   - **Compiled datasets on Indian native birds and butterflies during visit.**

3) **Visiting Researcher at University of California, Berkeley (May 2017 to Aug 2017)**
   - **Project on deep transfer learning with class imbalance and limited data.**
   - **Visit was funded by Kevin Novins Travelling Scholarship.**

G. PROFESSIONAL PORTFOLIO

1) **MEMBERSHIP OF PROFESSIONAL BODIES**
   - Royal Society, NZ and Institution of Engineering and Technology (IET), UK
   - Chartered Electrical Engineer through IEI, India (License: AM150470-6)

2) **PEER REVIEW**
   - Journal: Pattern Recognition (Elsevier), Signal Processing Letters (IEEE)
   - Conferences: ICDAR, MICCAI, ACPR, IVCNZ, ISBI and others.

3) **CONFERENCE ORGANIZING COMMITTEE**
   - Asian Conference on Pattern Recognition (ACPR), Auckland, NZ, 2019.
   - Image and Vision Computing New Zealand (IVCNZ), Dunedin, NZ, 2019.

4) **AWARDS**
   - Diane Campbell Hunt Memorial Award for ecological conservation in NZ.
   - Best student paper award at the IEEE international conference IVCNZ, 2018.

5) **MEDIA RECOGNITION AND SCIENCE COMMUNICATION:**
   - Popular science interview (30 mins) on OAR FM NZ Radio (25 Feb, 2019).
   - News on PhD project broadcast in national Radio NZ (13 Jan, 2019).
   - Article in the Otago daily times on PhD project (12 Jan, 2019).
   - Article in Forest and Bird magazine NZ (Spring 2018 edition).

6) **FUNDING/GRANTS (amount: 138,450NZD, nos. 10 till 2019, listed in order of value)**
   - 75000NZD: University of Otago Doctoral Scholarship (3 years PhD studies)
   - 22000NZD: Audacious NZ Student Startup Grant (for 1 year + office space)
   - 18000NZD: Kevin Novins Travelling Scholarship (for 3 months visit to USA)
   - 6000NZD: Post PhD Publications Bursary (3 months, University of Otago)
   - 5000NZD: Callaghan NZ R&D Innovation Grant (set up R&D in my startup)
   - 5000NZD: Government of India MHRD Grant (for ME degree study in India)
   - 3000NZD: Univ. of Otago, Division of Sciences Grant (conference travel)
   - 2250NZD: Debesh Kamal Travelling Scholarship (one time travel grant)
   - 1200NZD: Diane Campbell Hunt Memorial Grant (conference travel)
   - 1000NZD: Visiting Scientist Grant (Indian Statistical Institute 2017 & 2019)

H. REFERENCES

1) **DR. BRENDAN MCCANE (relation: primary PhD supervisor at Otago)**
   - Affiliation: Professor, Dept of Computer Science, University of Otago, NZ.
   - Email: mccane@cs.otago.ac.nz, phone: +64 3 4798588
2) **DR. JENS RITTSCHER (relation: investigator of postdoc project at Oxford)**
   - Affiliation: Professor, Dept of Engineering Science, University of Oxford.
   - Email: jens.rittscher@eng.ox.ac.uk, phone: +44 1865 617675
3) **DR. UMAPADA PAL (relation: PhD co-supervisor, supervisor in earlier job)**
   - Affiliation: Professor and Head, CVPR Unit, Indian Statistical Institute.
   - Email: umapada@isical.ac.in, phone: +91 33 25752856

I. PUBLICATIONS (*H-index*: 7)

Note: My publishing surname is Chakraborti instead of Chakraborty; they are equivalent
Google Scholar profile: https://scholar.google.com/citations?user=ZlBre_IAAAAJ&hl=en

JOURNALS:

1) **M. Fan, T. Chakraborti, and J. Rittscher, "A deep attention mechanism for classification of fine-grained multi-instanced objects in biomedical images", *IEEE International Symposium on Biomedical Imaging (ISBI)*, 2020 (accepted for oral presentation).**
2) **R. Roy, T. Chakraborti, A. S. Chowdhury, "Deep learning-shape driven level set synergism for pulmonary nodule segmentation," Pattern *Recognition Letters,* 123: 31-38, 2019.**
3) **T. Chakraborti, B. McCane, S. Mills, and U. Pal, "LOOP Descriptor: Local Optimal Oriented Pattern", *IEEE Signal Processing Letters,* 25(5): 635-639, 2018.**
4) **T. Chakraborti, D. K. Jha, A. S. Chowdhury, and X. Jiang, "A self-adaptive matched filter for retinal blood vessel detection", *Machine Vision and Applications*, 26(1): 55-68, 2015.**
5) **T. Chakraborti, A. Chatterjee, A. Halder, and A. Konar, "Automated emotion recognition employing a novel modified binary quantum-behaved gravitational search algorithm with differential mutation" *Expert Systems*, 32(4): 522-530, 2015,**
6) **T. Chakraborti, A. Chatterjee, "A novel binary adaptive weight GSA based feature selection for face recognition using local gradient patterns, modified census transform, local binary patterns", *Engineering Applications of Artificial Intelligence*, 33: 80-90, 2014.**
7) **T. Chakraborti, K. Das Sharma, and A. Chatterjee, "A novel local extrema based gravitational search algorithm and its application in face recognition using one training image per class", *Engineering Applications of Artificial Intelligence*, 34: 13-22, 2014.**

CONFERENCE:

1) **M. Fan, T. Chakraborti, and J. Rittscher, "A deep attention mechanism for classification of fine-grained multi-instanced objects in biomedical images", *IEEE International Symposium on Biomedical Imaging (ISBI)*, 2020 (accepted for oral presentation).**
2) **T. Chakraborti, B. McCane, S. Mills, and U. Pal, "Fine-grained Collaborative K-Means Clustering", *IEEE Intl. Conference IVCNZ*, Auckland, 2018 (best student paper award).**
3) **T. Chakraborti, B. McCane, S. Mills, U. Pal, "A Generalised Formulation for Collaborative Representation of Image Patches (GP-CRC)", *British Machine Vision Conference*, 2017.**
4) **N. Tripathy, T. Chakraborti, M. Nasipuri, U. Pal, "A scale and rotation invariant scheme for multi-oriented Character Recognition", *IEEE International Conference on Pattern Recognition* (ICPR), 2016: 4041-4046.**
5) **T. Chakraborti, B. McCane, S. Mills, U. Pal, "Collaborative representation based fine-grained species recognition," *IEEE Intl. Conference IVCNZ*, 2016.**

ARXIV PREPRINT:

1) **T. Chakraborti, B. McCane, S. Mills, and U. Pal, "CoCoNet: A Collaborative Convolutional Network," arXiv:1901.09886, 2019.**
2) **T. Chakraborti, B. McCane, S. Mills, and U. Pal, "PProCRC: Probabilistic Collaboration of Image Patches," arXiv:1903.09123, 2019.**
3) **T. Chakraborti, A. Patra, and A. Noble, "Contrastive Fairness in Machine Learning", arXiv:1905:07360, 2019.**
4) **T. Chakraborti, B. McCane, S. Mills and U. Pal, "Distance Metric Learned Collaborative Representation Classifier"arXiv:1905:01168, 2019.**