ABIR DAS

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PERSONAL INFORMATION

Position: Postdoctoral Researcher, Boston University, Boston Nov 2016 - Present
Advisor: Dr. Kate Saenko
Research Area: Computer Vision (Activity Detection, Person Re-identification, Vision and Language , Video Summarization and Machine Learning in general)

EDUCATION

Ph.D., Electrical Engineering, Sep 2015
University of California, Riverside. GPA: 3.82/4.00
Advisor: Dr. Amit K. Roy-Chowdhury
Research Area: Computer Vision (Person Re-identification, Video Summarization, Active Learning and Machine learning in general)

M.S., Electrical Engineering, Jul 2013
University of California, Riverside. GPA: 3.82/4.00

B.E., Electrical Engineering, Jul 2003 - Jun 2007
Jadavpur University, Kolkata, India. GPA: 8.44/10.0

TECHNICAL SKILLS

- Programming Skill: Python, C, Lua, C#, VBA, C++ (familiar)
- Technical Softwares Known: Tensorflow, Torch, Caffe, Matlab
- Web Development: PHP, CSS3, HTML5, ASP (familiar)
- Database: MySQL (familiar)
- IDE: iPython, Microsoft Visual Studio.NET, Eclipse, Zerobrane Studio
- Operating System: Linux (CentOS, Ubuntu), Windows, Mac OS
- Other Expertise**:** MS Office (Word, Excel, and PowerPoint), Linux Shell Script, XML, Latex, ffmpeg.

RESEARCH EXPERIENCE

Postdoctoral Researcher, Nov 2016 – Present
Image and Video Computing Group, Boston University, Boston, MA.

- R-C3D: Region Convolutional 3D Network for Temporal Activity Detection (Python, caffe)
  - Developed end-to-end model to detect activities in untrimmed videos by incorporating proposal generation and classification networks along with predicting activity start and end times by regression.
- Top-down Visual Saliency Guided by Captions (Python, Tensorflow)
  - Developed a model for language driven visual search in videos which identifies spatiotemporally salient regions in frame sequences guided by either model generated descriptions or by external textual queries.

Postdoctoral Researcher, Nov 2015 – Oct 2016
Computer Vision and Learning Group, University of Massachusetts, Lowell, MA.

- Multimodal Video Description (Python, Tensorflow, Caffe)
  - Developed a sequence-to-sequence video description model capable of handling multi-modal auxiliary information like audio or video topic along with video content for generating automated natural language description of web videos.
  - Came 3rd as a team in MSR-VTT Video to Language challenge (co-organized along with ACM-MM 2016)

- Multiple Instance Triplet Network for Deep Metric Learning (Python, Tensorflow)
  - Multiple-instance learning approach for deep metrics is explored to handle weakly supervised bags of data. The triplet network based work has an added advantage of requiring much less supervision in terms of human annotated data and thus suits well within the systems with human-in-the-loop.
- Video based Re-identification with Dynamics Learned through LSTM (Lua, Torch)
  - Traditional person re-identification approaches are based on static images of persons in different cameras. We explored deep metric learning framework on motion features by learning the dynamics via LSTMs in an end-to-end framework.

Research Assistant, Sep 2010 – Sep 2015

Video Computing Group, University of California, Riverside, CA.

- Multi-Camera Person Identification Models through Sparse Non-redundant Representative Selection (Matlab, C++)
  - In the first stage, developed an information theoretic and attribute feedback based continuous active person Re-identification system.
  - In the second stage, developed a sparsity regularized non-redundant representative selection framework for multi-sensor person identification with a view to minimize the annotation effort of the human in the loop.
- Consistent Person Re-identification in a Camera Network. (Matlab, C++)
  - Developed a Binary Integer Program based framework for boosting multi-camera person re-identification performance by enforcing consistency across all possible pairs of camera
- Person Re-Identification in the Function Space of Feature Warps. (Matlab, C++)
  - Designing a person re-identification system across a non-overlapping camera network by studying the transformation of features across cameras and discriminating between feature transforms in a function space.
- Summarizing Multi-view Videos (Matlab)
  - Considered both inter-view and intra-view correlations between frames. The inter-view correlations are modeled as student-t distribution while intra-view correlations are modeled as Gaussian. The correlation given frame embeddings are used for sparse representative selection based summary generation.
  - Extended the above idea by using sparse subspace clustering to model the two types of similarities. It led to solving a standard eigenvalue problem. After getting the embeddings, a similar sparse representative selection approach as above gave the joint summary.
- Wide Area Tracking across non-overlapping Camera Views. (Matlab, C++, OpenCV)
  - Worked on implementing a wide area tracking framework leveraging upon the idea of multi-camera tracklet association based on MCMC sampling.

SELECTED PUBLICATIONS

1. Huijuan Xu, **Abir Das**, Kate Saenko, "R-C3D: Region Convolutional 3D Network for Temporal Activity Detection", In the Proceedings of IEEE ICCV, 2017, Venice, Italy.
2. Rameswar Panda, **Abir Das,** Ziyan Wu, Jan Ernst, Amit K. Roy-Chowdhury, "Weakly Supervised Summarization of Web Videos", In the Proceedings of IEEE ICCV, 2017, Venice, Italy.
3. Vasili Ramanishka, **Abir Das**, Jianming Zhang, Kate Saenko, "Top-down Visual Saliency Guided by Captions", In the Proceedings of CVPR, 2017, Honolulu, USA.
4. **Abir Das,** Rameswar Panda, Amit K. Roy-Chowdhury, "Continuous Adaptation of Multi-Camera Person Identification Models through Sparse Non-redundant Representative Selection", Computer Vision and Image Understanding, 2016.
5. Anirban Chakraborty, **Abir Das,** Amit K. Roy-Chowdhury "Network Consistent Data Association", In IEEE Trans. on Pattern Analysis and Machine Intelligence, 2016.
6. Niki Martinel, **Abir Das,** Christian Micheloni and Amit K. Roy-Chowdhury, "Temporal Model Adaptation for Person Re-Identification", In the Proceedings of ECCV, 2016, Amsterdam, The Netherlands.

7. Vasili Ramanishka, **Abir Das**, Dong Huk Park, Subhashini Venugopalan, Lisa Anne Hendricks, Marcus Rohrbach, Kate Saenko, "Multimodal Video Description", ACM Multimedia MSR-VTT Challenge, 2016, Amsterdam, The Netherlands.
8. Rameswar Panda, **Abir Das,** Amit K. Roy-Chowdhury, "Embedded Sparse Coding for Summarizing Multi-view Videos", In IEEE International Conference on Image Processing, 2016.
9. Rameswar Panda, **Abir Das,** Amit K. Roy-Chowdhury, "Video Summarization in a Multi-View Camera Network", In International Conference on Pattern Recognition, 2016.
10. **Abir Das,** Niki Martinel, Christian Micheloni and Amit K. Roy-Chowdhury, "Re-Identification in the Function Space of Feature Warps", In IEEE Trans. on Pattern Analysis and Machine Intelligence, Aug 2015.
11. **Abir Das,** Rameswar Panda, Amit K. Roy-Chowdhury, "Active Image Pair Selection for Continuous Person Re-identification", In IEEE International Conference on Image Processing, 2015.
12. **Abir Das,** Anirban Chakraborty and Amit K. Roy-Chowdhury, "Consistent Re-identification in a Camera Network", In the Proceedings of ECCV, 2014, Zurich, Switzerland.

RELEVANT COURSES TAKEN

- Linear System Theory
- Mathematical Methods for Electrical Engineers
- State and Parameter Estimation Theory
- Current Topics in Computer Vision and Pattern Recognition
- Optimal Control, Guidance and Estimation (NPTEL)
- Stochastic Processes
- Advanced Computer Vision
- Advanced Robotics
- Optimization
- Machine Learning (Coursera)

TEACHING EXPERIENCE

Teaching Assistant Apr 2014 – Jun 2014

Electrical Engineering Department, University of California, Riverside.

- Designed and conducted Lab, took discussion classes, prepared detailed solutions and graded homeworks for Signals and Systems (EE110B)

INDUSTRY EXPERIENCE

Consultant in the Performance Improvement group of PricewaterhouseCoopers Ltd, India. Jul 2007-Aug 2010

- Responsibilities:
  - Development of add-ins for MS Office (Word, Excel and PowerPoint) using the Visual Basic for Applications and Visual Studio Tools for Office (VSTO) in C#.
  - System and unit testing of the application.
  - Development of windows installer in C# DOT. NET platform, Wise Installation System and InstallShield.
- Summer Internship at Siemens India Jun 2006-Jul 2006
  - Worked on 'Application Based Selection of Motors' in the Automation and Drives division of Siemens India.

AWARDS and HONORS

- Our work on temporal activity detection (R-C3D) secured the "Most Innovative Solution" award in the ActivityNet challenge in IEEE CVPR, 2017, Honolulu, USA.
- Received young researcher award in IEEE CVPR, 2017, Honolulu, USA.
- Team (UMass Lowell, UT Austin, UC Berkeley) obtained 3rd position in MSR-VTT video to language challenge in ACM-MM 2016 out of 22 teams.
- Received Dean's Distinguished Fellowship, University of California, Riverside.
- Received the highest appraisal rating during the financial year 2009-10, known as "significantly exceeded the standards and expectations" in PricewaterhouseCoopers Ltd, India.

REFERENCES

Dr. Amit K. Roy-Chowdhury

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Riverside, CA, 92521, USA

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Associate Professor, Department of Mathematics and Computer Science
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