Ayan Acharya

Current Position

Research Engineer and Lead of Machine Learning at CognitiveScale Inc.

Contact Information

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Research Interests

Inference in probabilistic latent variable models, Bayesian nonparametrics, Dynamic Bayesian Networks, Transfer Learning, Matrix completion, Ensemble methods for clustering & classification, Unsupervised Deep Learning.

Education

- **Ph.D.**, Electrical and Computer Engineering (Specialization: Data Mining & Machine Learning)
University of Texas at Austin, Austin, TX 78712 **GPA 3.92(/4.00)** Aug 2012-Jul 2015
- **M.S.**, Electrical and Computer Engineering
University of Texas at Austin, Austin, TX 78712 **GPA 3.92(/4.00)** Aug 2009-May 2012
- **Bachelor of Engineering**, Electronics and Telecommunication Engineering
Jadavpur University, Kolkata, India **GPA 9.10(/10.00)** Aug 2005-Jun 2009

Scholarly Service Activities

- I have been part of program committee members of AAAI (2017, 2018), NIPS (2017), CIKM (2017), WWW (2017), ICDM (2016,2017), ACML (2016,2017), Machine Learning in Healthcare (2016).
- I regularly review papers from IEEE Transactions on Knowledge and Data Engineering (IEEE TKDE); IEEE Transactions on Neural Networks and Learning Systems (IEEE NNLS); IEEE Transactions on Big Data; ACM Transactions on Knowledge Discovery from Data (ACM TKDD); International Journal of Artificial Intelligence; International Journal of Neural Systems; Machine Learning Journal; Scientific Reports - Nature; Pattern Recognition Letters; Expert Systems with Application; Applied Soft Computing; Soft Computing – A Fusion of Foundations, Methodologies and ApplicationsSoft Computing, A Fusion of Foundations, Methodologies and Applications; Journal of Computing; International Journal of Internet Services and Applications; Integrated Computer-Aided Engineering.

Technical Expertise

- Engineering Software and Languages: Python, Matlab, SAS, R.
- Computer Programming Languages and Tools: C++, Java, Javascript, Scala, HTML, Bash, MySQL, Gradle, Maven, LaTeX, Docker,
- Operating Systems: Windows, LINUX/UNIX, OSX, NixOS, Android.

Course Works in Graduate Level

Probability and Stochastic Process I; Machine Learning; Real Analysis I; Data Mining; Sparsity, Structure and Algorithms; Introduction to Mathematical Statistics; Bayesian Statistical Methods; Optimization of Engineering Systems; Computational Statistics Applied to Bio-informatics; Advanced Data Mining; Convex Optimization; Natural Language Processing.

Internship Exposure

- Development of recommendation system for travel sites in Cognitive Scale, Austin, TX, Summer 2014.
- Learning of Yahoo! category taxonomy using labeled data from multiple corpora in Yahoo! Labs, Yahoo! Inc., Summer 2013.
- Real time collision avoidance system in car based on monocular camera vision in Office of the Chief Scientist, Qualcomm Inc., Summer 2012.
- Enhancement of product category classification in eBay Research Labs, Summer 2011.

Patents Under Submission

- Title: Cognitive Machine Learning Architecture – Application No. 15/432,523
- Title: Hierarchical Topic Machine Learning Operation – Application No. 15/432,525
- Title: Temporal Topic Machine Learning Operation – Application No. 15/432,533
- Title: Navigating a Hierarchical Abstraction of Topics via an Augmented Gamma Belief Network Operation – Application No. 15/432,535
- Title: Augmented Gamma Belief Network Operation – Application No. 15/432,536
- Title: Cognitive Attribution Operation, Cognitive Search Operation and Cognitive Browse Operation – Application No. 62/487,844

Research Publications (Arranged by type and chronologically)

- **Journal**

1. L.F. Coletta, E.R. Hruschka, **A. Acharya**, and J. Ghosh, **Using metaheuristics to optimize the combination of classifier and cluster ensembles**, Appearing in Integrated Computer-Aided Engineering.
2. L.F. Coletta, M. Ponti, E.R. Hruschka, **A. Acharya**, and J. Ghosh, **Combining Clustering and Active Learning for the Detection and Learning of New Image Classes**, International Journal of Image and Vision Computing (submitted), 2015.
3. L.F. Coletta, E.R. Hruschka, **A. Acharya**, and J. Ghosh, **A Differential Evolution Algorithm to Optimize the Combination of Classifier and Cluster Ensembles**, International Journal of Bio-Inspired Computation, vol. 7, No. 2, 2015.
4. **A. Acharya**, E. R. Hruschka, J. Ghosh, and S. Acharyya. **An Optimization Framework for Semi-Supervised and Transfer Learning using Multiple Classifiers and Clusterers**, ACM Transaction on Knowledge Discovery from Data, 9 (1) , ACM, New York, NY, USA pp.1:1-1:35, 2014.
5. J. Ghosh, **A. Acharya**. **Cluster Ensembles**, WIREs Data Mining and Knowledge Discovery: 1(4), July/Aug 2011, pp. 305-315.
6. D. Maiti, M. Chakraborty, **A. Acharya**, and A. Konar, **A partly deterministic and partly stochastic scheme for the identification of fractional-order processes**, International Journal of Advanced Intelligence Paradigms, 1 (3) , pp.332-357, 2009.
7. **A. Acharya**, K. Chattopadhyay, A. Banerjee, and A. Konar, **Novel and improved methods of regular geometric shape recognition from digital image using artificial ants**, International Journal of Intelligent Defense Support Systems, 1 (4) , pp.355-376, 2008.
8. **A. Acharya**, A. Banerjee, A. Konar, and L.C. Jain, **Extension of Ant System algorithms with exponential pheromone deposition rule for improved performance**, International Journal of Intelligent Defense Support Systems, 1 (4) , pp.319-354, 2008.

- **Conference**

1. A. Saha, **A. Acharya**, J. Ghosh and B. Ravindran. **Nonparametric Poisson Factorization Machines**. Proc. of International Conference on Data Mining 2015, pp. 967 – 972.
2. **A. Acharya**, M. Zhou, D. Teffer, M. Tyler and J. Ghosh. **Gamma Process Poisson Factorization for Joint Modeling of Network and Topics**. Proc. of European Conference on Machine Learning 2015, pp.283-299.
3. **A. Acharya**, M. Zhou, and J. Ghosh. **Nonparametric Bayesian Factor Analysis for Dynamic Count Matrices**. Proc. of International Conference on Artificial Intelligence and Statistics 2015, pp. 1-9.
4. **A. Acharya**, R. J. Mooney, and J. Ghosh. **Active Multitask Learning Using Both Latent and Supervised Shared Topics**. Proc. of SIAM Data Mining Conference 2014.
5. S. Gunasekar, **A. Acharya**, N. Gaur, and J. Ghosh, **Noisy Matrix Completion Using Alternating Minimization**, Proc. of European Conference on Machine Learning, Part II, LNAI 8189, pp.194-209, 2013.

6. **A. Acharya**, A. Rawal, R. J. Mooney, and E. R. Hruschka. **Using Both Latent and Supervised Shared Topics for Multitask Learning**. Proc. of European Conference on Machine Learning, Part II, LNAI 8189, pp.369-384, 2013.
7. **A. Acharya**, E. R. Hruschka, J. Ghosh, B. Sarwar, and J.D. Ruvini, **Probabilistic Combination of Classifier and Cluster Ensembles for Nontransductive Learning** Proc. of SIAM Data Mining Conference, pp. 288-296, 2013.
8. L. F. Coletta, E. R. Hruschka, **A. Acharya**, and J. Ghosh, **Towards the Use of Metaheuristics for Optimizing the Combination of Classifier and Cluster Ensembles**, Proc. of BRICS Countries Congress on Computational Intelligence, pp.1-6, 2013.
9. **A. Acharya**, J. Lee, A. Chen, **Real Time Car Detection and Tracking in Mobile Devices**, Proc. of International Conference on Connected Vehicles and Expo 2013.
10. **A. Acharya**, E. R. Hruschka and J. Ghosh, **A Privacy-Aware Bayesian Approach for Combining Classifier and Cluster Ensembles**. Proc. of 3rd IEEE International Conference on Information Privacy, Security, Risk and Trust, MIT, Boston, USA, 2011.
11. **A. Acharya**, A. Seetharam, A. Bhattacharyya, and M.K. Naskar, **Balancing Energy Dissipation in Data Gathering Wireless Sensor Networks Using Ant Colony Optimization**, Proc. of International Conference on Distributed Computing and Networking, pp.437-443, 2009.
12. M. Ghosh, A. Chakraborty, **A. Acharya**, A. Konar, and B.K. Panigrahi, **A recurrent neural model for parameter estimation of mixed emotions from facial expressions of the subjects**, Proc. of International Joint Conference on Neural Networks, pp.965-972, 2009.
13. **A. Acharya**, D. Maiti, A. Konar, and R. Janarthanan, **A Deterministic Model for Analyzing the Dynamics of Ant System Algorithm and Performance Amelioration through a New Pheromone Deposition Approach**, 4th International Conference on Information and Automation for Sustainability, 2008, pp.341-345.
14. **A. Acharya**, D. Maiti, A. Banerjee, and A. Konar, **Balancing Exploration and Exploitation by an Elitist Ant System with Exponential Pheromone Deposition Rule**, 3rd IEEE International Conference on Industrial and Information Systems, 2008, IIT Kharagpur, India.
15. D. Maiti, **A. Acharya**, R. Janarthanan, and A. Konar, **Complete Identification of a Dynamic Fractional Order System Under Non-ideal Conditions Using Fractional Differintegral Definitions**, 16th International Conference on Advanced Computing and Communications, 2008, pp. 285 - 292.
16. D. Maiti, **A. Acharya**, and A. Konar, **A Swarm Intelligence Based Scheme for Complete and Fault-tolerant Identification of a Dynamical Fractional Order Process**, 3rd IEEE International Conference on Industrial and Information Systems, 2008, IIT Kharagpur, India.
17. D. Maiti, **A. Acharya**, M. Chakraborty, A. Konar, and R. Janarthanan, **Tuning PID and FOPID Controllers using the Integral Time Absolute Error Criterion**, 4th International Conference on Information and Automation for Sustainability, 2008, pp.457-462.

- **Workshop**

1. **A. Acharya**, D. Teffer, M. Zhou, and J. Ghosh. **Network Discovery and Recommendation via Joint Network and Topic Modeling**. KDD Workshop on Social Recommender Systems, 2015.
2. **A. Acharya**, A. Saha, M. Zhou, D. Teffer and J. Ghosh. **Nonparametric Dynamic Relational Model**. KDD Workshop on Mining and Learning from Time Series, 2015.
3. **A. Acharya**, R. J. Mooney, and J. Ghosh. **Active Multitask Learning with Doubly Supervised Latent Dirichlet Allocation**. In NIPS 2013 Workshop on Topic Models.
4. **A. Acharya**, E. R. Hruschka, J. Ghosh, and S. Acharyya. **Transfer Learning with Cluster Ensembles**. In proceedings of ICML 2011 Workshop on Unsupervised and Transfer Learning, pp. 123–132, 2012.
5. **A. Acharya**, E. R. Hruschka, J. Ghosh, and S. Acharyya. **C^{3}E: A Framework for Combining Ensembles of Classifiers and Clusterers**. In 10th International Workshop on Multiple Classifier System, 2011, LNCS 6713, pp. 269–278. Springer, Heidelberg.

- **Book Chapter**

1. **A. Acharya** and R.J. Mooney and J. Ghosh. Active Multitask Learning Using Both Supervised and Shared Latent Topics. Appearing in Pattern Recognition: from Classical to Modern Approaches, 2016, edited by: S.K. Pal and A. Pal.
2. J. Ghosh and **A. Acharya**. Cluster Ensembles: Theory and Applications. Data Clustering: Algorithms and Applications, edited by: Charu C. Aggarwal and Chandan K. Reddy.
3. J. Ghosh and **A. Acharya**. A Survey of Consensus Clustering. Handbook of Cluster Analysis, edited by: C. Hennig, M. Meila, F. Murtagh, and R. Rocci.

References

- Dr. Joydeep Ghosh, Department of ECE, UT Austin, Email: ghosh@ece.utexas.edu.
- Dr. Raymond J. Mooney, Department of CS, UT Austin, Email: mooney@cs.utexas.edu.
- Dr. Mingyuan Zhou, McCombs School of Business, UT Austin, Email: mingyuan.zhou@mccombs.utexas.edu.
- Dr. Eduardo Raul Hruschka, Computer Science Department (SCC/ICMC), University of São Paulo (USP) at São Carlos, Brazil, Email: erh@icmc.usp.br.