

Arjun Reddy Akula (Mr.)

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Education

PhD in Computer Science & Statistics

[Sept 2016 – Present]

University of California, Los Angeles (UCLA)

Jointly Supervised by Prof. Song-Chun Zhu and Prof. Joyce Chai

Specialization in Computer Vision and Natural Language Processing (NLP)

Thesis Topic: Explainable Artificial Intelligence (XAI)

GPA: 3.93/4.0

MS by Research in Computer Science and Engineering

[Jul 2012 - Jun 2014]

IIIT Hyderabad, India

Jointly Supervised by Prof. Radhika Mamidi and Prof. Rajeev Sangal

Specialization in Natural Language Processing (NLP) and Machine Learning

Thesis Topic: Context based Natural Language Interfaces to Database (NLIDB) Systems

GPA: 9.02/10.0

B.Tech in Computer Science and Engineering

[Jul 2008 - Jun 2012]

IIIT Hyderabad, India

GPA: 9.02/10.0

Academic Activities

Reviewer/Sub-Reviewer: ACL 2019, CVPR 2019, ECCV 2018, EMNLP 2018,
EMNLP 2017, ICON 2018, ICON 2017

Panelist: UCLA Data Science Workshop 2018

Research Interests

- I am broadly interested in deep learning & its applications to the field of computer vision and natural language processing, with focuses on explainable AI models, visual question answering, visual discourse parsing and visual dialog.

Professional Experience

1) Research Software Engineer, IBM Research AI [Mar 2014 – Sept 2016]

I worked on a wide array of Natural Language Processing and Machine Learning projects at IBM Research AI. Following is a brief overview of my research work at IBM:

- Implemented a prototype to answer natural language queries in IT Services Domain using IBM Watson Question Answering System.
- Proposed a new set of Discourse relations among IT service tickets to improve classification accuracy of tickets. Filed a **US patent** application on this.
- Proposed and Implemented a new grammatical formalism called 'n-NLP' to parse noisy natural language sentences. Filed a **US patent** application on this.
- Designed and developed a novel Classification algorithm to classify problem tickets in IT Incident Management Process. **Published** a paper on this in a top-tier conference ICSOC 2014.
- Designed and developed a web based reporting tool to measure adoption, utilization and business benefits of dynamic automations in IT & services delivery research. Many business units of IBM are now using this tool for auto-remediation of tickets.

2) Course Instructor, IIIT Hyderabad [Jan 2014 - Mar 2014]

Co-taught a graduate level course "Advanced Natural Language Processing".

- 3) **Research Assistant (RA)**, UCLA [Sept 2017 – Present]
DARPA Explainable AI (XAI) Grant.
- 4) **Research Assistant (RA)**, IIIT Hyderabad [Aug 2010 - Dec 2012]
Designed and developed a web-based 3D *virtual laboratory* at IIIT-Hyderabad, funded by Ministry of Human Resource Development India (MHRD).
- 5) **Teaching Assistant (TA)**, IIIT Hyderabad
Computer Programming course (Aug 2013 - Dec 2013) and Humanities course (Aug 2009 - Dec 2009).
- 6) **Summer Intern**, Center for Exact Humanities (CEH), IIIT-Hyderabad [May 2011 - Aug 2011]
- 7) **Course Grader**, UCLA [Sept 2016 - Jun 2017]
Introduction to Statistical Reasoning course

Publications

- 1) **Arjun R. Akula**, Sari S, Changsong L, Sinisa T, Joyce C, Song-Chun Zhu, *Visual Explanation Dialog using Theory-of-Mind*, In International Joint Conference on Artificial Intelligence (IJCAI 2019) [submitted].
- 2) **Arjun R. Akula**, Sinisa T, Joyce C, Song-Chun Zhu, *Generating Counterfactual Explanations for Convolutional Neural Networks*, In DARPA XAI Meeting 2019, UC Berkeley [Poster].
- 3) **Arjun R. Akula**, Song-Chun Zhu, *Visual Discourse Parsing*, In CVPR 2019 workshop on Language and Vision [submitted].
- 4) **Arjun R. Akula**, Sinisa T, Joyce C, Song-Chun Zhu, *Natural Language Interaction with Explainable AI models*, In CVPR 2019 workshop on Explainable AI [submitted].
- 5) **Arjun R. Akula**, Sinisa T, Joyce C, Song-Chun Zhu, *Explainable AI: Gaining Justified Trust*, short version accepted in DARPA Naval Applications in Machine Learning (NAML 2019), San Diego.
- 6) **Arjun R. Akula**, Rajeev Sangal, Radhika Mamidi. *A Novel Approach towards Incorporating Context Processing Capabilities in NLIDB System*. In Proceedings of the International Joint Conference on Natural Language Processing (IJCNLP 2013), pages 1216-1222, Nagoya, Japan, October 2013.
- 7) Agarwal S, Agarwal V, **Arjun R. Akula**, Gargi B, Sridhara G. *Automatic Problem Extraction and Analysis from Unstructured Text in IT Tickets*. In IBM Journal of Research and Development, 2017.
- 8) Gupta A, **Arjun R. Akula**, Deepak M, Puneeth K, Vinay A, Rajeev Sangal. *A Novel Approach towards Building a Portable NLIDB System Using the Computational Paninian Grammar Framework*. In Proceedings of the International Conference on Asian Language Processing (IALP 2012), Nov 2012, pages 93-96, Hanoi, Vietnam. IEEE, 2012.
- 9) Ashish P, Ruthu S, **Arjun R. Akula**, Radhika Mamidi. *Classification of Attributes in a Natural Language Query into Different SQL clauses*. In Proceedings of the Recent Advances in Natural Language Processing (RANLP 2015), pages 497-506, Hissar, Bulgaria, September 2015.
- 10) Gargi B, Tapan K, **Arjun R. Akula**, Shivali A, Shripad J. *Towards Auto-Remediation in Services Delivery: Context-Based Classification of Noisy and Unstructured Tickets*. In Proceedings of the International Conference on Service-Oriented Computing (ICSOC 2014), Nov 2014, pages 478-485, Springer Berlin Hiedelberg, 2014.
- 11) Vasu P, **Arjun R. Akula**, Syed A. *A Web-based Virtual Laboratory for Electromagnetic Theory*. In Proceedings of the International Conference on Technology for Education (T4E 2013), Dec 2013, pages 13-18. IEEE, 2013.

Patents

- 1) **Arjun R. Akula**, Gargi B Dasgupta, Tapan K Nayak. *Analyzing Unstructured Ticket Text Using Discourse Cues in Communication Logs*, Disclosure Number: IN920150227, July 2015. **US Patent App.**

- 2) Shivali A, **Arjun R. Akula**, Gargi B, Tapan K, Shripad J. *A System and Method for Structured Representation and Classification of Unstructured Tickets in Services Delivery*, Disclosure Number: IN820140677, Oct 2014. **US Patent App.**
- 3) **Arjun R. Akula**, Gargi B, Vijay E, Ramasuri N. *Measuring Effective Utilization of a Service Practitioner for Ticket Resolution via a Wearable Device*, Disclosure Number: IN920160178US1, Aug 2016, **US Patent App.**

Awards/Achievements

- Received **Research Award - 2012** at IIIT-Hyderabad for outstanding research work on Question Answering Systems.
- Received **Research Division Award - 2016** at IBM Research AI for proposing a novel text classification algorithm to classify problem tickets in IT Incident Management Process.
- Received **Outstanding Research Accomplishment Award - 2015** at IBM Research AI for designing and developing a web based reporting tool to measure adoption, utilization and business benefits of dynamic automations in IT Incident Management Process.
- Received **IBM Manager's Choice Award - 2014** for outstanding research contributions to Noisy Text Analytics at IBM Research AI.
- Awarded **Dean's list I** (For the top 5% of students) for academic excellence in the semesters *Spring 2011, Monsoon 2010 and Spring 2010* at IIIT-Hyderabad.
- Awarded **Dean's list II** (For the top 5-10% of students) for academic excellence in the semesters *Monsoon 2011 and Spring 2012* at IIIT-Hyderabad.
- Received **IBM Team Lunch Award – 2014** at IBM Research AI for filing outstanding patents and for publishing research papers in top-tier conferences.
- Ranked 2613 of more than 8,00,000 candidates in All India Engineering Entrance Examination (**AIEEE**) - 2008.
- Ranked 4203 of more than 3,00,000 candidates in **IIT JEE** - 2008.
- Ranked 1154 of more than 2,00,000 candidates in **EAMCET** - 2008.

Related Course Work

Machine Learning, Natural Language Processing (NLP), Statistical Modeling and Learning in Vision and Cognition, Matrix Algebra and Optimization, Distributed Systems, Statistical Programming, Statistical Methods in Artificial Intelligence, Monte Carlo Methods for Optimization, Computational Linguistics, Algorithms, Operating Systems, Database Systems, Computer Networks, Programming in C, Data Structures, Artificial Intelligence, Cloud Computing (Audit), Structured System Analysis and Design, Principles of Programming Languages, Product Design and Engineering, Computer Graphics.

Technical Skill Set

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|------------------------------|--|
| Programming Languages | C, C++, Python, Java, Matlab, Shell scripting, R |
| Web Technologies | HTML, JSP, PHP, Mod_python, Javascript, CSS |
| Miscellaneous | PyTorch, TensorFlow, Keras, Apache Hadoop, Spark, IBM SCALA, Ganglia, Libvirt, Java 3D, LibSVM, GIZA++, Neo4j, Latex |

Invited Talks

- **Sixth IIIT-H Advanced Summer School on NLP (IASNLP 2015)**
Context based NLIDB and Dialogue Systems