Manish Shetty M

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Research Interests

Areas	Programming Systems (PL/SE), Data Systems.
Topics	Program Synthesis, Data Management, Visualization.

Education

Aug'22–Present	**University of California, Berkeley**, *Ph.D. in Computer Science*, *Area: Programming Systems*.
Aug'16–May'20	**PES University, Bangalore**, *B.Tech in Computer Science and Engineering (Honors).* GPA – 9.51/10.0

Experience

Jul'20–	**Microsoft Research**, *Research Fellow*, Bangalore, India. Domains: Software Engineering, Machine Learning, Data Science, Systems Advisors: Chetan Bansal, Dr. Suman Nath, Dr. Thomas Zimmermann
Jan'20–Jun'20	**Microsoft Research**, *Research Intern*, Bangalore, India. Domains: Software Engineering, Machine Learning, NLP Advisors: Chetan Bansal, Dr. Nachiappan Nagappan, Dr. Thomas Zimmermann
Jul'19–Jun'20	**PES Center for Pattern Recognition**, *Research Assistant*, Bangalore, India. Domains: Machine Learning, Healthcare Systems Advisors: Dr. Gowri Srinivasa
Jun'19–Aug'19	**Deloitte Touche Tohmatsu LLC**, *ML Intern*, Bangalore, India. Domains: Cyber Security, Data Science, Machine Learning Advisors: Dr. Vikram Venkateshwaran

Patents

Jun 19, 2020	**Automatic Recognition of Entities Related to Cloud Incidents**, *USPTO*.
Jun 28, 2021	**Automation of Troubleshooting Guides using Meta-Learning**, *USPTO*.
Aug 26, 2021	**Performing Quality-Based Action(s) Regarding Engineer-Generated Documentation Associated with Code and/or Application Programming Interface**, *USPTO*.
Sep 24, 2021	**Crash Localization using Crash Frame Sequence Labeling**, *USPTO*.

Achievements

2016-2020	**Prof CNR Rao Scholarship**, *CS Department, PES University*, (6x recipient).
2020	**Dr. MRD Merit Scholarship**, *CS Department, PES University*.

Publications

Under Review	**AutoTSG: Learning and Synthesis for Incident Troubleshooting**, [pdf]. Manish Shetty, C. Bansal, S. Upadhyayula, A. Radhakrishna, A. Gupta *Preprint, under review, 2022* (12 pages)

ICSE'22	**DeepAnalyze: Learning to Localize Crashes at Scale**, [pdf]. Manish Shetty, C. Bansal, S. Nath, S. Bowles, H. Wang, O. Arman, S. Ahari *International Conference on Software Engineering, 2022* (12 pages) Acceptance Rate ≈ 26% (197/751)
EMSE	**SoftNER: Mining Knowledge Graphs From Cloud Incidents**, [pdf]. Manish Shetty, C. Bansal, S. Kumar, N. Rao, N. Nagappan *Empirical Software Engineering (SEIP Special Issue)* (15 pages)
ICSE'21	**Neural Knowledge Extraction from Cloud Service Incidents**, [pdf]. Manish Shetty, C. Bansal, S. Kumar, N. Rao, N. Nagappan and T. Zimmermann *International Conference on Software Engineering - SEIP, 2021* (12 pages) Acceptance Rate ≈ 33.8% (41/121) ***Nominated for the IEEE Software Distinguished Paper Award*** (5/41) 🏆 ***Featured in VentureBeat, TechZine, etc.*** 🏆
EMBC'21	**A Machine Learning Understanding of Sepsis**, [pdf]. Manish Shetty, V. Menon, P. Athri, G. Srinivasa *IEEE Engineering in Medicine and Biology Society* (5 pages)
CONECCT'21	**Exploration and Comparison of Modern AI Algorithms to Predict Drug Efficacy**, [pdf]. Manish Shetty, A. Kasi, R. Neil, V. Murali, P. Athri, G. Srinivasa *IEEE International Conference on Electronics, Computing and Communication Technologies, 2020* (5 pages)

Talks

2021	**"DeepAnalyze: AI Assisted Crash Dump Analysis"**. ○ Lab Sabha, Microsoft Research India, Oct'21 (virtual) ○ Conference Presentation, ICSE 2022, May'22 (virtual)
2021	**"A Machine Learning Understanding of Sepsis"**. ○ Conference Presentation, EMBC 2021, Oct'21 (virtual)
2020-2021	**"Neural Knowledge Extraction from Cloud Service Incidents"**. ○ Applied Sciences & Engineering Group, Microsoft Research India, Nov'20 (virtual) ○ Conference Presentation, ICSE SEIP 2021, Jun'21 (virtual)

Academic Service

2022	**Reviewer**, *ICLR 2022*.
2022	**Reviewer**, *IET Software*.
2021	**Shadow Program Committe**, *MSR 2021*.
2021	**Reviewer**, *JSERD*.

Selected Projects

Feb'21–Jul'22	**Learning to Localize Crashes at Scale**, *Microsoft Research*. ○ Designed & developed ***DeepAnalyze*** - a deep learning system to localize crashing faults from crash stacks. ○ Empirically analyzed the complexity and heterogeneity of large-scale crashes. ○ Conceptualized a **novel sequence labeling formulation** utilizing both semantic and context stack information. ○ Showed the effectiveness of **transfer learning** to build models for **cross-application** scenarios with minimal data. ○ This work was accepted at ***ICSE 2022***.
Dec'21–May'21	**Mining Knowledge Graphs From Cloud Incidents**, *Microsoft Research*. ○ Extended *Soft*NER by mining and scoring **binary entity relations**. ○ Used entities and relations to construct an incident **knowledge-graph**. ○ Used clustering and a custom **path based score** to identify entity-incident relevance. ○ This work is *Under Review at EMSE (SEIP Special Issue)*.

Jan'20–Feb'21 **Neural Knowledge Extraction from Cloud Service Incidents**, *Microsoft Research*.
- Designed & built ***Soft*NER**– a framework for weak-supervised knowledge extraction from incident reports.
- Framed the problem as a domain agnostic **named-entity recognition** task.
- Proposed a **type-aware Multi-task neural architecture** for knowledge extraction.
- Integrated into Microsoft's IcM system and has enriched over 10K+ incidents.
- This work was accepted at ***ICSE (SEIP) 2021*** and featured on ***VentureBeat***.

Jan'20–Jun'20 **A Machine Learning Understanding of Sepsis**, *PES University*.
- Predicted two outcomes in sepsis patients - **Sepsis and Comorbidity Severity**.
- Used **local interpretable model-agnostic explanations** to analyze models.
- Harmonized consistencies/contradictions about Sepsis, between humans and models.
- This work was accepted at ***IEEE EMBC 2021***

Relevant Courses

Undergraduate Deep Learning, Machine Learning + Practicum, NLP, Linear Algebra, Software Engineering, Operating Systems, Networking, Cloud Computing, Data Science, Discrete Math and Logic, Algorithms + Practicum, Advanced Algorithms

Skills

Languages Python, C/C++, C#
Frameworks Keras, PyTorch, Tensorflow, scikit-learn, OpenCV, NLTK
WebD HTML/CSS, JavaScript, Django, Jekyll
Utilities Anaconda, Git, Jupyter Notebook

References

Chetan Bansal, *Principal Research SDE*, Microsoft Research, Redmond, [🌐].

Dr. Nachiappan Nagappan, *IEEE & ACM Fellow*, Meta (Facebook), Seattle, [🌐].

Dr. Tom Zimmermann, *IEEE & ACM Fellow*, Microsoft Research, Redmond, [🌐].

Dr. Suman Nath, *Partner Research Manager*, Microsoft Research, Redmond, [🌐].

Dr. Gowri Srinivasa, *Professor*, PES University, Bangalore, [🌐].