Manish Shetty M

Research Fellow, Microsoft Research India
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Google Scholar

Education

PES University, Bangalore *Aug'16 – May'20*
B.Tech in Computer Science and Engineering (*Honors*) | *Specialization in Data Science*
Cum. GPA: **9.51**/10.0 (3.98/4.0)
6X recipient of **Prof CNR Rao Scholarship**, Computer Science, PES University
1X recipient of **Dr. MRD Merit Scholarship**, Computer Science, PES University

Work Experience

Microsoft Research, Bangalore, India *July'20 – Present*
Research Fellow
Domains: Software Engineering, Machine Learning, Systems
Advisors: Chetan Bansal, Dr. Suman Nath, Dr. Thomas Zimmermann, Dr. Nachiappan Nagappan

Microsoft Research, Bangalore, India *Jan'20 – June'20*
Research Intern
Domains: Software Engineering, Machine Learning, NLP
Advisors: Chetan Bansal, Dr. Nachiappan Nagappan, Dr. Thomas Zimmermann

Deloitte Touche Tohmatsu LLC, Bangalore, India *June'19 – Aug'19*
ML Research Intern
Domains: Cyber Security, Data Science, Machine Learning
Advisor: Dr. Vikram Venkateshwaran

Publications

Large-scale Crash Localization using Multi-Task Learning [preprint] [Under Review]
Manish Shetty, C. Bansal, S. Nath, S. Bowles, H. Wang, O. Arman, S. Ahari
Preprint (12 pages)

SoftNER: Mining Knowledge Graphs From Cloud Incidents [preprint] [Under Review]
Manish Shetty, C. Bansal, S. Kumar, N. Rao, N. Nagappan
Preprint (15 pages)

Neural Knowledge Extraction from Cloud Service Incidents [pdf] [talk] [ICSE 2021]
Manish Shetty, C. Bansal, S. Kumar, N. Rao, N. Nagappan and T. Zimmermann
43^{rd} International Conference on Software Engineering - SEIP, 2021 (12 pages)
Acceptance Rate $\approx$ **33.8%** $(41/121)$
Nominated for the IEEE Software Distinguished Paper Award $(5/41)$
Featured in VentureBeat: "Microsoft's SoftNER AI uses unsupervised learning to help triage cloud service outages"

A Machine Learning Understanding of Sepsis [pdf] [EMBC 2021]
Manish Shetty, V. Menon, P. Athri, G. Srinivasa
43^{rd} International Conference of the IEEE Engineering in Medicine and Biology Society (5 pages)

Exploration and Comparison of Modern AI Algorithms to Predict Drug Efficacy [pdf] [CONECCT 2020]
Manish Shetty, A. Kasi, R. Neil, V. Murali, P. Athri, G. Srinivasa
6^{th} IEEE International Conference on Electronics, Computing and Communication Technologies, 2020 (5 pages)

Academic Service

- **Reviewer Mentee [invited]** — *International Conference on Learning Representations 2022* [ICLR'22]
- **Shadow Program Committee** — *Mining Software Repositories Conference 2021* [MSR'21]
- **Reviewer** — *Journal of Software Engineering Research and Development* [JSERD]

Patents

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

Projects

- **Learning to Localize Crashes at Scale** *Feb'21 – present*
  Advisors: Chetan Bansal, Dr. Suman Nath, *Microsoft Research*
  - Designed and developed ***DeepAnalyze*** - a deep learning based solution 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.
  - Working on deploying an online-learning pipeline for continuously improving DeepAnalyze in the wild.
  - Working on creating a library of tools for related tasks like faulty thread localization, problem bucetization, etc.
  - This work is *Under Review*.

- **Mining Knowledge Graphs From Cloud Incidents** *Dec'20 – Feb'21*
  Advisors: Chetan Bansal, *Microsoft Research*
  - Extended *Soft*NER by mining **binary entity relations** and scoring them using **normalized PMI**.
  - Used entities and relations to construct an incident **knowledge-graph**.
  - Used a combination of clustering and a **novel path based score** to identify entity-incident relevance.
  - This work is *Under Review*

- **Neural Knowledge Extraction from Cloud Service Incidents** *Jan'20 – Aug'20*
  Advisors: Chetan Bansal, Dr. Nachiappan Nagappan, and Dr. Thomas Zimmermann, *Microsoft Research*
  - Designed & built ***Soft*NER**– a framework for weak-supervised knowledge extraction from service incident reports.
  - Framed the problem as a domain agnostic and extensible **named-entity recognition** task.
  - Proposed a **type-aware Multi-task neural architecture** for knowledge extraction.
  - *Soft*NER is now integrated into Microsoft's IcM system and has enriched over 9K+ incidents.
  - This work was accepted at ***ICSE 2021*** and featured on ***VentureBeat***.

- **A Machine Learning Understanding of Sepsis** *Jan'20 – Jun'20*
  Advisors: Dr. Gowri Srinivasa, *PES University*
  - Proposed an approach to predict two outcomes in sepsis patients - **Sepsis Severity** and **Comorbidity Severity**.
  - Used **local interpretable model-agnostic explanations** and other methods to analyze models.
  - Harmonized consistencies/contradictions about Sepsis, between expert human knowledge and that of a model.
  - This work was accepted at ***IEEE EMBC 2021***.

- **Exploration and Comparison of Modern AI Algorithms to Predict Drug Efficacy** *Sept'19 – Feb'20*
  Advisors: Dr. Gowri Srinivasa, *PES University*
  - Worked on improving the critic in **ReLeaSE - Reinforcement learning framework for de-novo drug design**.
  - Improved learning using path-context based encoding and data-augmentation for canonical SMILES.
  - This work was accepted at ***IEEE CONNECT 2020***.

- **Denoising and Segmentation of Epigraphs** *Sept'18 – May'19*
  Advisors: Dr. Mamatha H R, *PES University*
  - Proposed algorithms utilizing noise templates to denoising engraved inscriptions.
  - Work on fixed prior noise template-matching was published in ***Springer's AISC 2020*** *[pdf]*.
  - Work on inferring noise as a factor of character area was published in ***Elsevier's PCS 2020*** *[pdf]*.

References

- Chetan Bansal — Principal Research SDE, Microsoft Research, Redmond [🌐]
- Dr. Nachiappan Nagappan — *IEEE & ACM Fellow*, Software Engineer, Facebook, Redmond [🌐]
- Dr. Thomas Zimmermann — *IEEE Fellow*, Sr. Principal Researcher, Microsoft Research, Redmond [🌐]
- Dr. Suman Nath — Partner Research Manager, Microsoft Research, Redmond [🌐]
- Dr. Gowri Srinivasa — Professor, PES University, Bangalore [🌐]