

# 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, Research Fellow**, Bangalore, India

July'20 – Present

Domains: Software Engineering, Machine Learning, Systems

Advisors: [Chetan Bansal](#), [Dr. Suman Nath](#), [Dr. Thomas Zimmermann](#), [Dr. Nachiappan Nagappan](#)

**Microsoft Research, Research Intern**, Bangalore, India

Jan'20 – June'20

Domains: Software Engineering, Machine Learning, NLP

Advisors: [Chetan Bansal](#), [Dr. Nachiappan Nagappan](#), [Dr. Thomas Zimmermann](#)

**PES Center for Pattern Recognition, Research Assistant**, Bangalore, India

July'19 – June'20

Domains: Machine Learning, Healthcare Systems

Advisors: [Dr. Gowri Srinivasa](#)

**Deloitte Touche Tohmatsu LLC, ML Research Intern**, Bangalore, India

June'19 – Aug'19

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<sup>rd</sup> 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** [\[pdf\]](#) [\[talk\]](#)

[EMBC 2021]

Manish Shetty, V. Menon, P. Athri, G. Srinivasa

43<sup>rd</sup> 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<sup>th</sup> IEEE International Conference on Electronics, Computing and Communication Technologies, 2020 (5 pages)

## Academic Service

> **Reviewer Mentee**

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

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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

## Talks & Presentations

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“Neural Knowledge Extraction from Cloud Service Incidents”

- > Applied Sciences & Engineering Group, Microsoft Research India
- > Conference Presentation, ICSE 2021

Nov'20 (remote)

Jun'21 (remote)

“DeepAnalyze: AI Assisted Crash Dump Analysis”

- > Lab Sabha, Microsoft Research India

Oct'21 (remote)

## Selected Projects

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### • 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 bucketization, etc.
- > This work is *Under Review*.

### • Knowledge Fabric for Incident Management

Advisors: [Chetan Bansal](#), [Dr. Nachiappan Nagappan](#), and [Dr. Thomas Zimmermann](#), Microsoft Research

#### ▶ Neural Knowledge Extraction from Cloud Service Incidents

Jan'20 – Nov'20

- > Designed & built **SoftNER** – a framework for weak-supervised knowledge extraction from 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.
- > **SoftNER** 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**.

#### ▶ Mining Knowledge Graphs From Cloud Incidents

Dec'20 – Feb'21

- > Extended **SoftNER** 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*

### • 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**.

## References

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- > Chetan Bansal
- > Dr. Nachiappan Nagappan
- > Dr. Thomas Zimmermann
- > Dr. Suman Nath
- > Dr. Gowri Srinivasa

Principal Research SDE, Microsoft Research, Redmond   
*IEEE & ACM Fellow*, Software Engineer, Facebook, Redmond   
*IEEE Fellow*, Sr. Principal Researcher, Microsoft Research, Redmond   
Partner Research Manager, Microsoft Research, Redmond   
Professor, PES University, Bangalore 