

# 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, Data Science, 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

5. **DeepAnalyze: Learning to Localize Crashes at Scale** [pdf] (ICSE 2022)  
Manish Shetty, C. Bansal, S. Nath, S. Bowles, H. Wang, O. Arman, S. Ahari  
*International Conference on Software Engineering, 2022* (12 pages)  
Acceptance Rate  $\approx$  26% (197/751)
4. **SoftNER: Mining Knowledge Graphs From Cloud Incidents** [preprint] (Under Review)  
Manish Shetty, C. Bansal, S. Kumar, N. Rao, N. Nagappan  
*Under Review at EMSE (SEIP Special Issue)* (15 pages)
3. **Neural Knowledge Extraction from Cloud Service Incidents** [pdf] [talk] (ICSE 2021)  
Manish Shetty, C. Bansal, S. Kumar, N. Rao, N. Nagappan and T. Zimmermann  
*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" 🏆
2. **A Machine Learning Understanding of Sepsis** [pdf] [talk] (EMBC 2021)  
Manish Shetty, V. Menon, P. Athri, G. Srinivasa  
*International Conference of the IEEE Engineering in Medicine and Biology Society* (5 pages)
1. **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  
*IEEE International Conference on Electronics, Computing and Communication Technologies, 2020* (5 pages)

## ACADEMIC SERVICE

- **Reviewer** *International Conference on Learning Representations 2022 (ICLR' 22)*  
*Recommended from reviewer mentee pool for excellent review.* 🏆
- **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) Sept 24, 2021

## TALKS & PRESENTATIONS

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- “Neural Knowledge Extraction from Cloud Service Incidents”
  - Applied Sciences & Engineering Group, Microsoft Research India Nov’20 (virtual)
  - Conference Presentation, ICSE 2021 Jun’21 (virtual)
- “DeepAnalyze: AI Assisted Crash Dump Analysis”
  - Lab Sabha, Microsoft Research India Oct’21 (virtual)
- “A Machine Learning Understanding of Sepsis”
  - Conference Presentation, EMBC 2021 Oct’21 (virtual)





## 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 was accepted at **ICSE 2022** [5].
- **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 10K+ incidents.
    - This work was accepted at **ICSE (SEIP) 2021** [3] 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 at EMSE (SEIP Special Issue)* [4].
- **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** [2].
- **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.
  - Showed simpler classifiers like random-forest can be better critics than the original LSTM in ReLeaSE.
  - This work was accepted at **IEEE CONNECT 2020** [1].

## REFERENCES

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- 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 