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
Dr. MRD Merit Scholarship & **Prof CNR Rao Scholarship** (top 2%) for academic performance.

Work Experience

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

Microsoft Research, Bangalore, India *Jan'20 – June'20*
Research Intern
Advisors: Chetan Bansal, Dr. Nachiappan Nagappan, Dr. Thomas Zimmermann

Deloitte Touche Tohmatsu LLC, Bangalore, India *June'19 – Aug'19*
ML Research Intern
Advisor: Dr. Vikram Venkateshwaran

Publications

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

Neural Knowledge Extraction from Cloud Service Incidents [pdf] `[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 ≈ **34%** | Featured in ***VentureBeat***
Nominated for the IEEE Software Distinguished Paper Award

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

Academic Service

- **Reviewer Mentee (invited)** *10^{th} International Conference on Learning Representations 2022* `[ICLR'22]`
- **Shadow Program Committee** *18^{th} Mining Software Repositories Conference 2021* `[MSR'21]`
- **Reviewer** *Journal of Software Engineering Research and Development* `[JSERD]`

Patents

Automatic Recognition of Entities Related to Cloud Incidents filed with the USPTO *June 19, 2020*
M. Shetty, C. Bansal, S. Kumar, N. Rao, N. Nagappan, T. Zimmermann

Automation of Troubleshooting Guides using Meta-Learning filed with the USPTO *June 28, 2021*
M. Shetty, C. Bansal, P. Kapoor, T. Sharma, R. Mittal, A. Malhotra

Performing Quality-Based Action(s) Regarding Engineer-Generated Documentation Associated with Code and/or Application Programming Interface *Filing in Progress*
A. Gupta, C. Bansal, **M. Shetty**

Research Experience

- **Semantic and Context Aware Crash Localization** *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.
  - 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 is *to be submitted* to **ICSE 2022**.

- **Meta-Learning for Few-Shot Command Extraction** *Nov'20 – Feb'21*
  Advisors: Chetan Bansal, *Microsoft Research*
  - Formulated the the command extraction problem as a multi-class sentence classification task.
  - Worked on building a **meta-learning** approach to learn to classify from few labeled examples.

- **Mining Knowledge Graphs From Cloud Incidents** *Dec'20 – Feb'20*
  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.
  - Under submission at *Empirical Software Engineering* journal

- **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 **Multi-task Bi-LSTM-CRF** model with attention mechanism.
  - *Soft*NER is now integrated into Microsoft's IcM system and has enriched over 9K+ incidents.
  - This work was accepted at ***ICSE 2021***(Acceptance Rate ≈ 34%) 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.
  - Showed simpler classifiers like random-forest can be better critics than the original LSTM in ReLeaSE.
  - 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]*.

Relevant Courses

Deep Learning • Machine Learning + Practicum • Natural Language Processing • Linear Algebra • Software Engineering • Research Methodology • Data Science • Data Analytics • Discrete Math and Logic • Algorithms + Practicum • Advanced Algorithms • Engg Math I & II