Joseph K J

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Research Interests

Continual Learning, Deep Learning, Machine Learning.

Education

Indian Institute of Technology (IIT), Hyderabad	9.24 / 10
M. Tech + PhD Dual Degree in Computer Science and Engineering	*Jan 2017 - present*
Excellence in Research Award recipient	
Advisor: Dr. Vineeth N Balasubramanian	
Government Engineering College (RIT), Kottayam	80.43 %
B. Tech. in Computer Science and Engineering	*May 2013*
Loyola School, Trivandrum	92.93 %
Indian School Certificate (ISC), Class 12	*March 2009*

Research Experience

- **Student Researcher, Google Research, Bangalore, India**.   August 2021 - Present
  Research Intern   April 2021 - July 2021
  Working on identifying novel categories of images without supervision.

- **Visiting Scholar, MBZ University of AI, Abu Dhabi, UAE**.   August 2021 - Present
  Research Intern   October 2020 - March 2021
  Defined a novel computer vision problem: Open World Object Detection

- **Research Intern, Inception Institute of AI, Abu Dhabi, UAE**.   November 2019 - May 2020
  Worked on adding lifelong learning capability to object detectors using meta-learning.

- **Research Intern, Harada Lab, University of Tokyo, Japan**.   June - July 2018
  Explored areas related to multi-modal modeling, specifically on generating images from textual descriptions.

Publications

2022: Two CVPR papers

11. K J. Joseph, S. Khan, F. Khan, R.Anwer, V. Balasubramanian, Energy-based Latent Aligner for Incremental Learning, *IEEE/CVF International Conf. on Computer Vision and Pattern Recognition*, **CVPR 2022**.

10. A. Gupta, S Narayan, K J. Joseph, S. Khan, F. Khan, M Shah, OW-DETR: Open-world Detection Transformer, *IEEE/CVF International Conf. on Computer Vision and Pattern Recognition*, **CVPR 2022** [Link]

2021: TPAMI, CVPR-Oral

9. K J. Joseph, J. Rajasegaran, S. Khan, F. Khan, V. Balasubramanian, Incremental Object Detection via Meta-Learning, *IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**)*. [Link]

8. K J. Joseph, S. Khan, F. Khan, V. Balasubramanian, Towards Open World Object Detection, *IEEE/CVF International Conf. on Computer Vision and Pattern Recognition*, **CVPR 2021** as an **ORAL** paper. [Link]

2020: NeurIPS, BMVC

7. K J. Joseph, V. Balasubramanian, Meta-Consolidation for Continual Learning, 34th *Conference on Neural Information Processing Systems*, **NeurIPS 2020**. [Link]

6. U. Maniyar, K J. Joseph, A. Deshmukh, U. Dogan, V. Balasubramanian, Zero-shot Domain Generalization, 31st *British Machine Vision Conference*, **BMVC 2020**. (Also presented at *Visual Learning with Limited Labels Workshop, International Conf on Computer Vision and Pattern Recognition*, **CVPR-W 2020**.) [Link]

2019: IJCAI, WACV

5. <u>K J. Joseph</u>, V. Teja, K. Singh, V. Balasubramanian, Submodular Batch Selection for Training Deep Neural Networks, 28th *International Joint Conference on Artificial Intelligence,* **IJCAI 2019**, *Macao, China.* (Also presented orally at *Negative Dependence in ML Workshop, International Conference on Machine Learning,* **ICML-W 2019**, *Long Beach, USA.*) [Link]

4. <u>K J. Joseph</u>, A. Pal, S. Rajanala, V. Balasubramanian, C4Synth: Cross-Caption Cycle-Consistent Text-to-Image Synthesis *IEEE Winter Conf. on Applications of Computer Vision,* **WACV 2019**, *Hawaii, USA.* [Link]

2018: ICML-W, ECCV-W

3. <u>K J. Joseph</u>, V. Balasubramanian, MASON: A Model AgnoStic ObjectNess Framework, *International Workshop On Autonomous Navigation in Unconstrained Environments, European Conference on Computer Vision,* **ECCV-W 2018**, *Munich, Germany.* [Link]

2. Pengfei Zhu, Longyin Wen et al., VisDrone-DET2018: The Vision Meets Drone Object Detection in Image Challenge Results, *European Conference on Computer Vision, Workshop Proceedings,* **ECCV-W 2018**, *Munich, Germany.* [Link]

1. <u>K J. Joseph</u>, A. Pal, S. Rajanala, V. Balasubramanian, Zero-Shot Image Generation by Distilling Concepts from Multiple Captions, *Towards Learning with Limited Labels Workshop, International Conference on Machine Learning,* **ICML-W 2018**, *Stockholm, Sweden.* [Link]

Work Experience

- **Senior Software Engineer, Oracle Corporation,** July 2016 - Dec 2016.
  Developer at Oracle PeopleSoft Cloud Manager product team. Contributed to design, coding, implementation and UX of the product.
- **Software Engineer, Oracle Corporation,** June 2013 - July 2016.
  As part of Oracle Peoplesoft Platforms team, I handled PeopleTools Push Notification Framework, PeopleTools Automated Configuration Management Framework and PeopleSoft Internet Architecture.

Achievements

- Awarded *Excellence in Research Award 2020* from IIT Hyderabad. (One of 24 students across 16 departments)
- Awarded TCS Research *PhD Fellowship 2019*.
- *Honorable Mention* for our essay submission at ICVSS 2019, Italy.
- Awarded *Microsoft Research Travel Grant* and *ACM-India/IARCS Grant* to present our work at IJCAI 2019.
- Awarded *Certificate of Appreciation in Research* from IIT Hyderabad in March 2019.
- Won cash prize for being top 20% of attendees at '2017 Summer School on Computer Vision', CVIT, IIIT H.
- Runner up for *Best Student Project Contest 2013* from the Computer Society of India, Trivandrum Chapter.

Service

- Web chair for ACML 2022.
- Program Committee Member of IJCAI '21, '20.
- Reviewer: (Journals) IEEE Trans on Multimedia, Elsevier Pattern Recognition, Springer Machine Learning. (Conferences) CVPR '22, CVPR '21, AAAI '21, ACML '20, ICVGIP '18, NCVPRIPG '19.
- Subreviewer: NeurIPS ('20, '21), ICLR '20, IJCAI ('18, '19), ACML '20, ECCV '20, CVPR '19, ICCV '17, WACV ('18, '19, '20), SDM '21.

Research Forums Attended

- Conferences: CVPR 2021, NeurIPS 2020, IJCAI 2019, WACV 2019, ECCV 2018, ICVGIP 2018
- International Computer Vision Summer School - ICVSS 2019, Sicily, Italy.
- Microsoft Academic Research Summit: 2019, 2018
- Amazon Research Days 2019

Skills

- Languages: Python, Java, C, JavaScript
- Libraries and Tools: PyTorch, TensorFlow, Caffe, Numpy, Scipy, scikit-learn, OpenCV
- Miscellaneous: Shell Scripting, Dockers, Node.js, Hybrid Mobile App development, Git, ClearCase

Relevant Courses

- CS6510 Applied Machine Learning
- CS5370 Deep Learning for Vision
- CS6230 Optimization Methods in ML
- CS5350 Bayesian Data Analysis
- CS6440 Special Topics in Machine Learning
- CS6010 Advanced Data Structures and Algorithms

Positions / Responsibilities

- Founding member of ACM Student Chapter, IIT Hyderabad.
- Founding Secretary of IEEE Computer Society, RIT Chapter.
- Chief Editor of Click!, the half yearly publication of IEEE Computer Society, RIT Chapter.
- Facilitator at Fun@Work, an Oracle Volunteer initiative.

References

- Dr. Vineeth N Balasubramanian, Associate Professor, Department of Computer Science & Engineering, IIT Hyderabad, Sangareddy, Telangana - 502285, India. E-mail: vineethnb@iith.ac.in
- Dr. Salman Khan, Associate Professor, Mohamed bin Zayed University of Artificial Intelligence, Abu Dhabi, UAE. E-mail: salman.khan@mbzuai.ac.ae