Curriculum Vitae/Resume

Ekdeep Singh Lubana
Email: eslubana@umich.edu

Education

Ph.D. (Pre-candidate), University of Michigan, Ann Arbor *August, 2019–May, 2024 (expected)*
Major: Embedded Systems
GPA: 4.0/4.0

B.Tech., Indian Institute of Technology, Roorkee *July, 2015–May, 2019*
Major: Electronics and Communication Engineering
Thesis: Resource Efficient Techniques for Embedded Machine Vision *(Nominated for Best Bachelor's Thesis)*

Areas of Interest

· Unsupervised Learning, Embedded Machine learning, Optimization, Statistical Physics.

Internships

· **Research Intern**, Pervasive Systems Team, Nokia Bell Labs, UK. *Sept, 2021–Dec, 2021*
Advisor: Akhil Mathur

· **Research Intern**, Physics and Informatics Lab, NTT Research Inc. *May, 2021–Aug, 2021*
Advisor: Hidenori Tanaka

Publications

1. **Ekdeep Singh Lubana**, Robert P. Dick, and Hidenori Tanaka. Beyond BatchNorm: Towards a General Understanding of Normalization in Deep Learning. *arXiv:cs.LG*, 2021. https://arxiv.org/pdf/2106.05956.pdf.

2. **Ekdeep Singh Lubana**, Puja Trivedi, Danai Koutra, and Robert P. Dick. How do Quadratic Regularizers Prevent Catastrophic Forgetting: The Role of Interpolation. In *ICML Workshop on Theory and Foundations of Continual Learning*, 2021

3. **Ekdeep Singh Lubana** and Robert P. Dick. A Gradient Flow Framework For Analyzing Network Pruning. In *Int. Conf. on Learning Representations (ICLR)*, 2021. Accepted for **spotlight presentation** (<**5.5%** of all submissions).

4. **Ekdeep Singh Lubana**, Robert P. Dick, Vinayak Aggarwal, and Pyari Mohan Pradhan. Minimalistic Image Signal Processing for Deep Learning Accelerators. In *Proc. Int. Conf. on Image Processing (ICIP)*, 2019. Typical conference acceptance rate: <40%.

5. **Ekdeep Singh Lubana**, Vinayak Aggarwal, and Robert P. Dick. Machine Foveation: An Application-Aware Compressive Sensing Framework. In *Proc. Data Compression Conference (DCC)*, 2019. Typical conference acceptance rate: <30%.

6. **Ekdeep Singh Lubana** and Robert P. Dick. Digital Foveation: An Energy-Aware Machine Vision Framework. *In Proc. Int. Conf. Hardware/Software Codesign and System Synthesis (CODES+ISSS)*, 2018. Typical conference acceptance rate: <25%.

7. **Ekdeep Singh Lubana**, Mangesh Rajan Gurav, and Maryam Shojaei Baghini. Snap: Chlorophyll Concentration Calculator Using RAW Images of Leaves. In *Proc. IEEE Sensors*, pages 1–4, 2018. Acceptance rate: 25.4%.

Patents

1. **Ekdeep Singh Lubana** and Robert P. Dick. Digital foveation for machine vision, 25 2021. U.S. Patent Application No. 17/032,499

2. **Ekdeep Singh Lubana**. An Optical Device to Calculate Nitrogen Concentration in Leaves, August 25 2017. India Patent App. 201611027953 A

3. **Ekdeep Singh Lubana**. An Apparatus Based on RAW Images that can Calculate Nutrient Concentration in Leaves, September 08 2017. India Patent App. 201711029780 A

Technical Awards

· Awarded the **BIRAC-GYTI award** by the **President of India.** *2018*
· Winner of the **Ericsson Innovation Challenge** held at the Nobel Museum, Stockholm, Sweden. *2017*
· Winner of the **Jury's Choice Award** at the **Accenture Innovation Challenge.** *2017*
· **Gold medal** and **winner of Engineers' Conclave** at **Inter-IIT Tech meet.** *2018*

Academic achievements & Scholarships

· Awarded the **KVPY (Kishore Vaigyanik Protsahan Yojna)** Fellowship by Govt. of India. *2015*
· Awarded the **NTSE (National Talent Search)** Scholarship by N.C.E.R.T., New Delhi. *2014*
· Ranked amongst **Top 300** students in **National Standard Examination in Astronomy.** *2015*

Teaching Experience

· **Graduate Student Instructor** *Winter, 2020*
EECS-200 (Electrical Engineering Systems Design I)
· **Teaching Assistant** *Spring, 2019*
ECN-316 (Digital Image Processing)