Practically Efficient Computer Vision Models using Image Quantization

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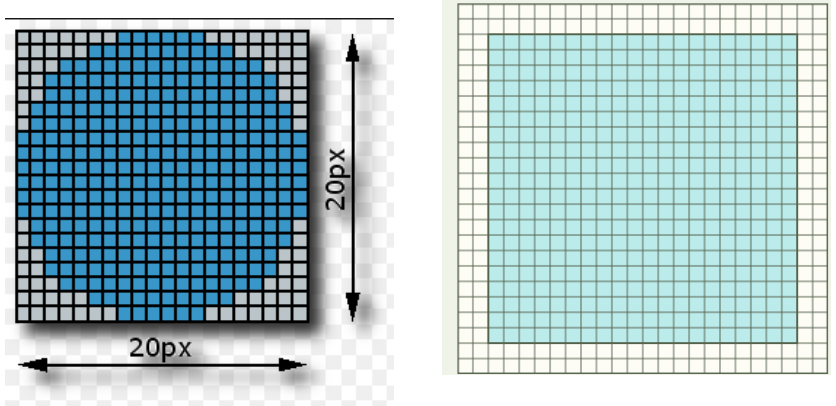
Supervised by Prof. Dr. Margret Keuper and Mishal Fatima

Motivation

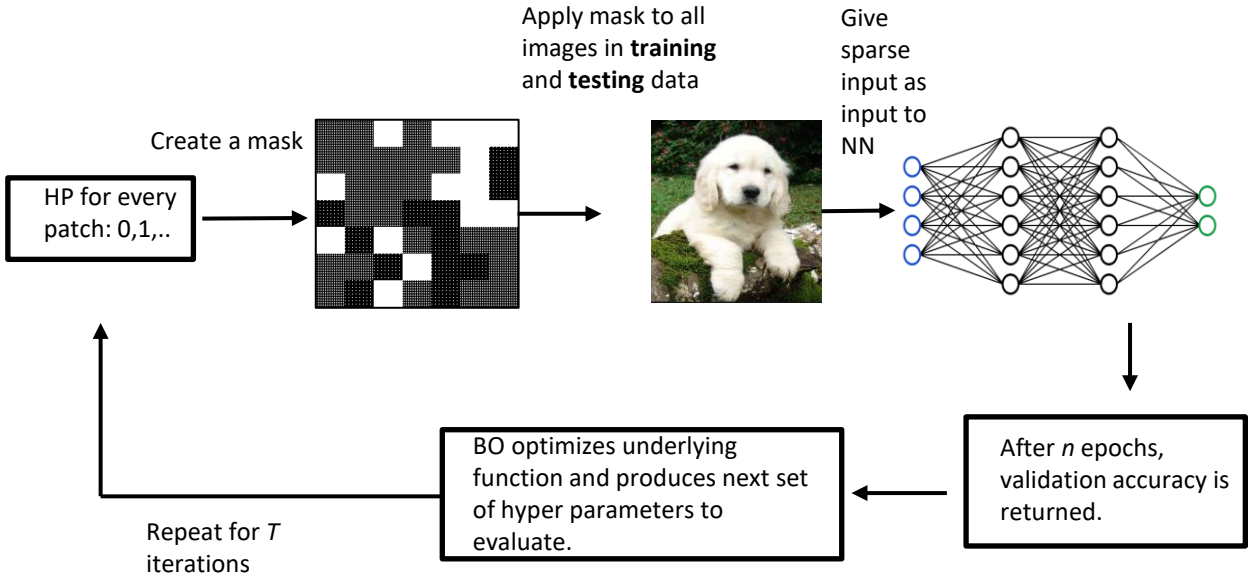
- Neural networks often rely on ***uniform pixel grid*** data from sensors to process information.

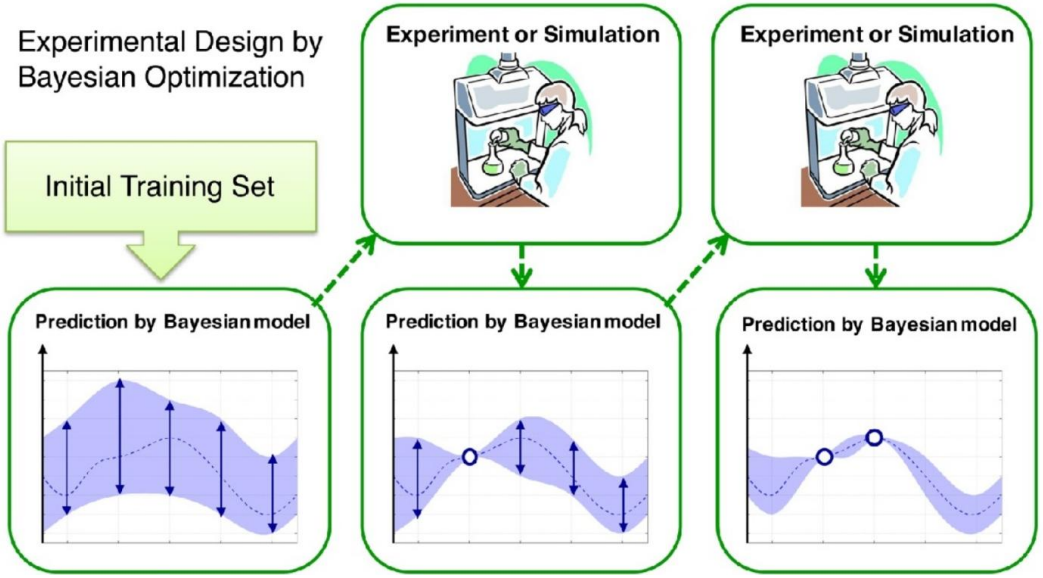
- It may result in the following:
  - ➢ Increased computational costs because of high frame rate between sensor and neural network.

- Can we benefit from a non-uniform pixel layout that best suits our downstream task?



General Idea





Goal: Get meaningful layouts without compromising on performance.

Downstream Tasks: Classification, Object Detection, Semantic Segmentation, Optical Flow Estimation

What will you learn ?

1. Running code on SLURM/uni cluster.
2. Managing code repository and anaconda environments efficiently.
3. Training and testing different architectures for various downstream tasks.
4. Use of Bayesian Optimization.
5. **Goal**: Draft a conference paper and submit it.

Some Details

- **Language:** English
- **Duration:** 1 Semester
- **Min/Max number of participants:** 3-5
- **Prerequisites:** Python Programming Skills, Basic Usage of Python
- **Applicable to MMDS:** yes
- **Online:** Possible

Before the project starts (~1 month)

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- Basics of VSCode/python/pytorch.
- SLURM Usage.
- Use of Bwcluster.
- Making python environment.
- Github basics.
- Relevant papers to read and play around with existing code.

Contact

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Thanks