**Short Story Assignment Proposal**

**“A Deep Journey into Super-resolution: A Survey”**

**Overview:** A comparison of more than 30+ state-of-the-art super resolution (SR) Convolution Neural Networks (CNNs) over six datasets to benchmark single image super-resolution. A taxonomy of deep-learning based super-resolution networks has been introduced which groups existing methods into nine categories as linear, residual, multi-branch, recursive, progressive, attention-based, and adversarial designs. This paper also provides comparison of models in various criteria like model input and output, network complexity, memory footprint, learning details, type of network loses, and important architecture differences. Several shortcomings of the existing techniques are identified and provided with future research directions.

**Source:** <https://arxiv.org/pdf/1904.07523.pdf>

Their contribution is five-fold:

1. A thorough review of recent techniques for Single Image Super Resolution (SISR).
2. Introduce a new taxonomy of the SR algorithms based on their structural differences.
3. Performed comprehensive analysis based on number of parameters, algorithm settings, training details and important architectural innovations that leads to performance improvements.
4. Systematic evaluation of algorithms on six publicly available datasets.
5. Discuss the challenges and provide insights into possible future directions.

The overall taxonomy used in the literature is shown in the below figure:

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The datasets used for evaluating algorithms include: Set5, Set14, BSD100, Urban100, DIV2K, and Manga109.

Representative test images from six super-resolution datasets used for comparing and evaluating algorithms is shown below.

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**Ablation Studies and Metrics:**

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Comparison of Multiplication-Addition operations in various SR networks.

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Comparison of number of parameters in various SR architectures.

Mean Peak Signal-to-noise ratio and Structural Similarity index for the SR methods evaluated on the benchmark datasets.

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