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Exploring deep learning for data-efficient and generalizable visual recognition

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Stellingen

Behorende bij het proefschrift

Exploring Deep Learning for Data-Efficient and Generalizable Visual Recognition

1. The gap between base classes and novel classes remains a fundamental bottleneck in few-shot learning, regardless of training strategy. [Chapter 3]
2. In few-shot image classification, the ability to rapidly adapt to novel categories hinges on learning a feature space that is both discriminative and well-structured. [Chapter 4]
3. Metric-based few-shot models are particularly sensitive to feature noise, as small perturbations can disproportionately affect similarity relationships under limited supervision. [Chapter 5]
4. Feature enrichment is particularly important in few-shot learning because limited labeled data cannot adequately compensate for weak or incomplete representations. [Chapter 6]
5. Transferring only task-relevant knowledge reduces negative interference and improves generalization to unseen classes.
6. Few-shot learning performance is often constrained more by representation bias than by model capacity, especially when novel classes differ subtly from base classes.
7. Few-shot learning is analogous to human concept acquisition. With limited examples, effective understanding relies on abstraction rather than memorization.
8. The key to robust few-shot learning lies in enabling models to generalize beyond observed instances.
9. Few-shot learning can reduce inequalities in access to artificial intelligence by enabling useful models for communities and institutions with limited data.
10. The social value of artificial intelligence is revealed not by how well it serves the average case, but by whether it remains useful to people who are poorly represented in its training data.

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