Simplicity in Complexity: A Critical Examination of Deep Learning Models versus Traditional Shallow Models in AI Applications

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Abstract:

The aim of the thesis will be the methodology proposal and a deep analysis of the testing scenarios for the measurement of the algorithm complexity. The thesis should contribute to the answer to the research question: Is the complex model of deep learning always better than a traditional shallow model? The student should consider critical examination of algorithm/model performance, achieved results vs. expected behaviour, the time and energy consumption in comparison of improvement of the final model of deep learning vs. traditional shallow model on real or real-based problems, retraining and fine-tuning under the transfer learning frame. The overall comparison methodology will be composed with specific consideration of algorithm complexity, implementation aspects, computation resource requirements and practical usage of these algorithms. Based on this methodology, several problems will be analysed and reevaluated regarding the proposed approaches. The thesis should offer testing methodology and testing recommendations before the final production version of applications is launched in the industry/public. The final consideration will also be focused on the effective usage of computation methods and resources in terms of ecological aspects.

Literature:

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