

# Workflow of Artificial Intelligence: The Relationship between Speed and Accuracy

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## **INTRODUCTION:**

The workflow of artificial intelligence projects begins with cleaning and labeling data. It proceeds over feature engineering, model selection, and hyper-parameter tuning to finally get to the training of the model. Once the model is ready, it can be used at inference to solve the original task.

Each one of these major steps in the workflow can be assisted by tools that make that step either easier, faster or better than the, largely manual, process of today. Data labeling is augmented by semi-automatic labeling methods. Feature engineering can be automated by creating synthetic features on the fly. Model selection and hyper-parameter tuning are essentially search problems that can also be automated.

These possibilities will be illustrated and the common denominator discussed: All of these tools assume that the training of the model is fast. That can be accomplished by training the model on many computers simultaneously – distributed training.

We illustrate the saving of time and the improvement of model accuracy in various domains such as natural-language-processing and image classification and segmentation.

## **Keywords:**

Data labeling; model selection; hyper-parameter tuning; distributed training; autoML

## **BIOGRAPHY:**

Patrick is the Vice-President of Artificial Intelligence at Samsung SDSA where he heads the AI Engineering and AI Sciences teams. Among his other responsibilities is to act as a visionary for the future of AI at Samsung. Before joining Samsung, Patrick spent 15 years as CEO at Algorithmica Technologies. Prior to that, he was assistant professor of applied mathematics at Jacobs University in Germany, as well as a researcher at Los Alamos National Laboratory and NASA's Jet Propulsion Laboratory. Patrick obtained his machine learning PhD in mathematics and his Masters in theoretical physics from University College London.