




# Deep semi-supervised learning for image classification


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# INTRODUCTION




- Weakness of Deep learning
  - Semi supervised learning
  - Unlabeled and labeled data
  - Improve performance
  - Training data limited
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# Role of unlabeled data




- Learn more about the underlying patterns in the data
  - Leveraging this additional information
  - Make better predictions on new, unseen data
  - Reduce overfitting in the model by providing a more diverse set of examples to train on
  - Help the model to generalize better to new data, improving its overall accuracy.
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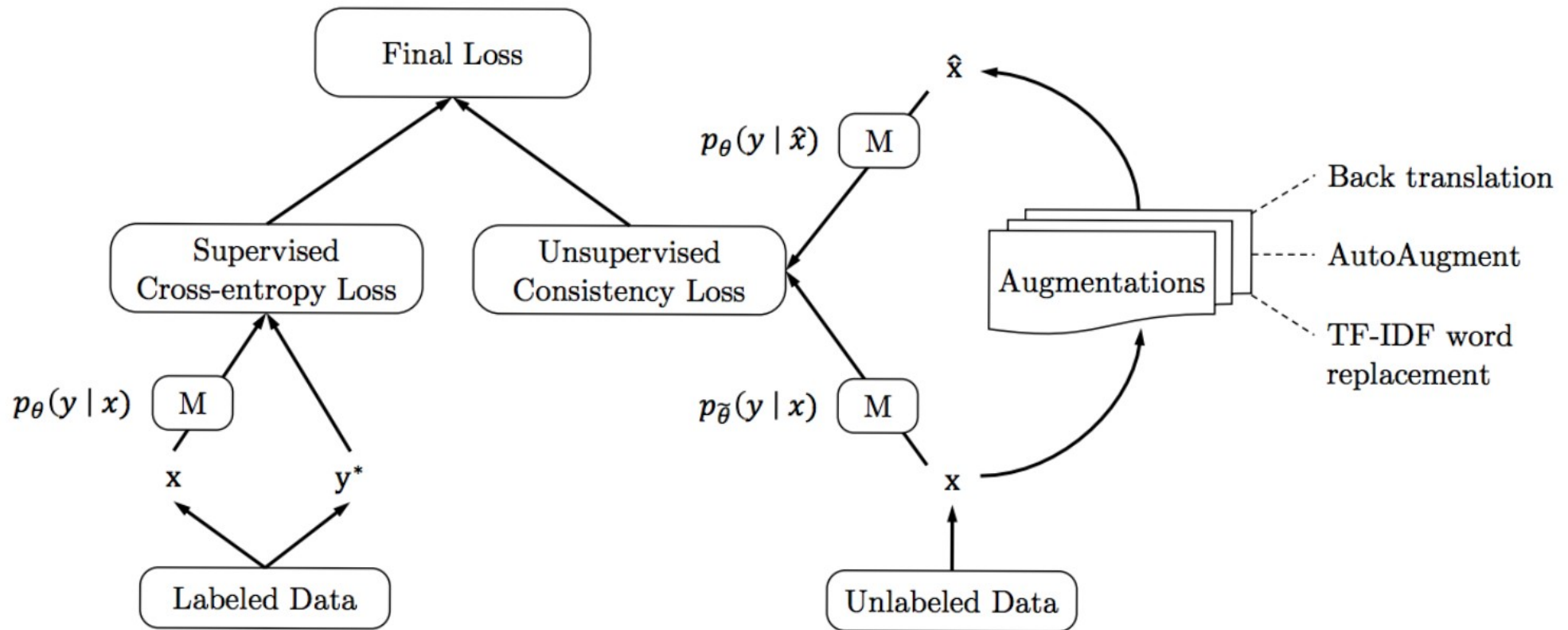
# Importance of Labeled Data



- Ground truth labels that the model uses to learn how to classify new images
  - Classify unlabeled data
  - Improve the quality of the model's predictions by allowing for more precise tuning of the model's parameters
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# Unsupervised Data Augmentation




# Resultats MNIST data


## CNN vs CNN with UDA

Modèle	Accuracy	Loss
CNN sans RandAugment	0.68	2.06
CNN avec RandAugment	0.73	1.15




# Challenges of Deep Semi-Supervised Learning




- Large amounts of computing power
  - Difficulty of choosing the right hyperparameters for the model
  - Time-consuming process that requires extensive experimentation
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# Applications of Deep Semi-Supervised Learning



- medical imaging
  - remote sensing
  - natural language processing
  - field of autonomous vehicles
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# CONCLUSION



Deep semi-supervised learning is a powerful technique for image classification that combines the strengths of both labeled and unlabeled data. While it presents several challenges, it has the potential to revolutionize many fields, from healthcare to transportation.

As computing power continues to increase and deep learning techniques become more refined, we can expect to see even more exciting developments in the field of deep semi-supervised learning in the coming years.







**THANK YOU !!!**

