# Data Collection

——Background——

"Data Mining: Methods and Applications"

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- **Background**
- **Data Acquisition**
- **Data Labeling**
- **Improvement of Existing Data and Models**
- **How to Decide which Data Collection Techniques to Use When**
- **Interesting Future Research Challenge**


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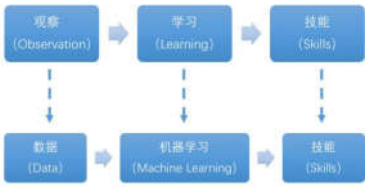
## Background

- **The reasons for data collection**
  - New applications(data mining, machine learning) do not necessarily have enough labeled data.
    - Traditional Machine Translation and Object Detection: massive amounts of data
    - New Applications: manual labeling(expensive and domain expertise )
  - Unlike traditional machine learning, deep learning techniques automatically generate features, which saves feature engineering costs, but in return may require larger amounts of labeled data.





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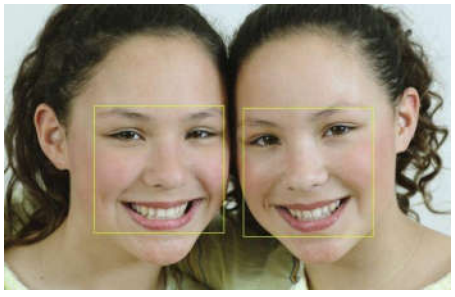
## Background

- **Related Applications**
  - Machine Learning(ML), Natural Language Processing(NLP) and Computer Vision(CV)
    - End to end (端到端) machine learning applications: collecting, cleaning, analyzing, visualizing, and feature engineering
  - Data Management



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## Background

- **There is a pressing need of accurate and scalable data collection techniques in the era of Big data.**
  - Share and search new datasets: data acquisition techniques can be used to discover, augment, or generate datasets.
  - Once the datasets are available, various data labeling techniques can be used to label the individual examples.
  - Instead of labeling new datasets, it may be better to improve existing data or train on top of trained models.

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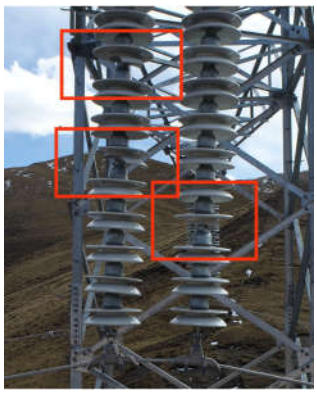
## Background

- **Labeling Data**



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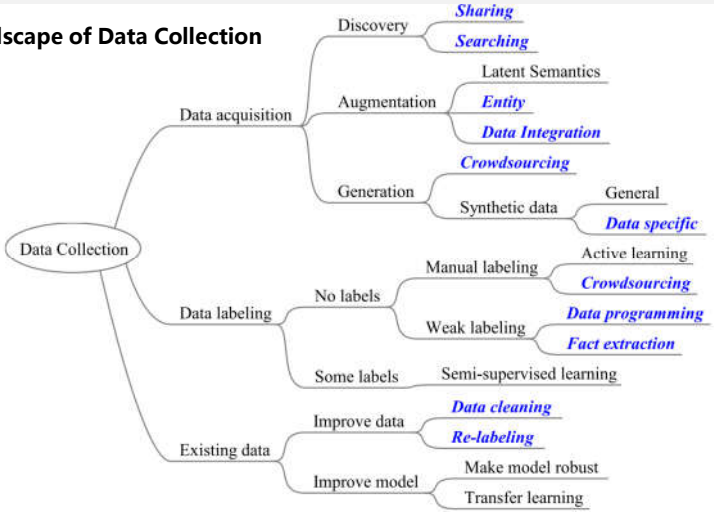
## Background

- **Research Landscape of Data Collection**




**Research Landscape**:

The topics that are at least partially contributed by the data management community are highlighted using blue italic text.

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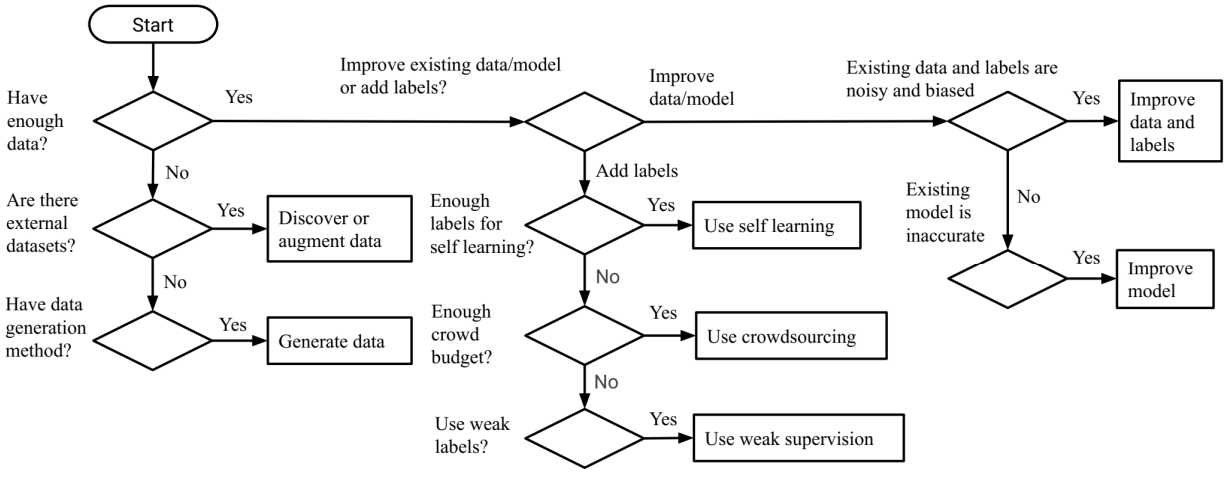
## Background

- **A general decision flow chart of the data collection techniques**



## Background

- **Data Acquisition :** data discovery, data augmentation and data generation
- **Data Labeling :** utilizing existing labels, using crowdsourcing techniques, and using weak supervision
- **Improving Existing Data or Models**
- **Method Integration :** Put all techniques together

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# Thanks !