# Exploiting the Ground-Truth: An Adversarial Imitation Based Knowledge Distillation Approach for Event Detection

**Jian Liu, Yubo Chen, Kang Liu**

Institute of Automation, Chinese Academy of Sciences

## Task Description

Event Detection Task:

Event detection aims to identify event triggers and their corresponding event types from unstructured texts, for example:

He died in hospital.

| | | | |
|---|---|---|---|
| Event Type | ***Die*** | | Event Detection |
| Trigger | ***died*** | | |
| Arguments | ***He*** | Role=***Person*** | Argument Extraction |
| | ***hospital*** | Role=***Place*** | |

## Motivation

### Ambiguity in Language

*S*1: *The European Unit* is set to **release** *20 million* euros to Iraq.

*S*2: The government reports that *Anwar* 's earliest **release** date is *April 14*.

Transfer-Money or Release-Parole ?

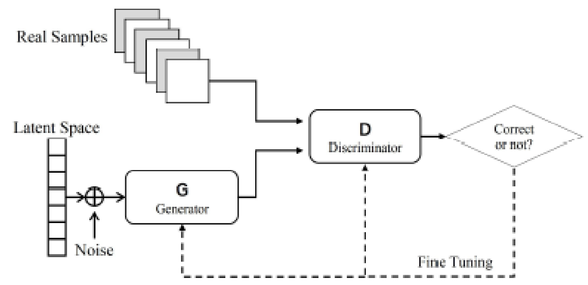
- Entity information is helpful for disambiguation event types, however, golden entity information is only accessible in training procedure, and is not accessible in test procedure.
- Current Approaches use external NLP tool to predict entities and they often suffer from error propagation problem.

## Contributions

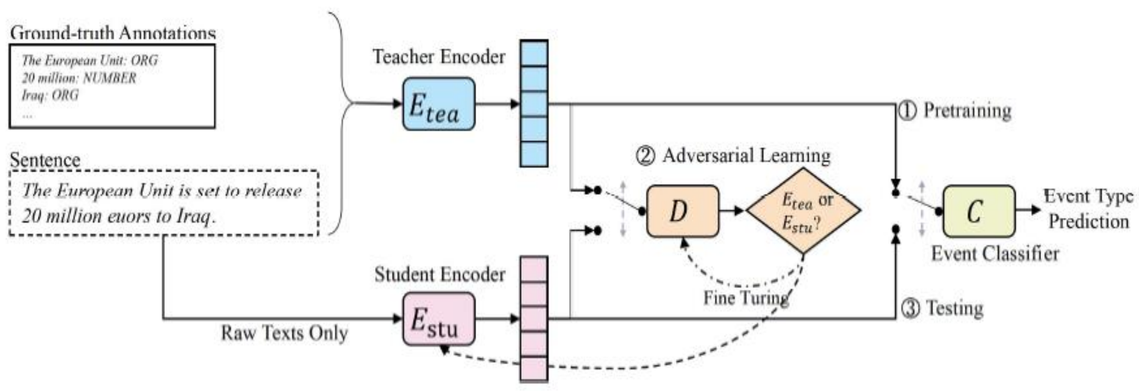
- A new adversarial imitation based knowledge distillation approach is designed to tackle the challenge.
- Our approach learns to incorporate the knowledge distillation process into feature encoding stage, in a implicit manner. It requires no external NLP toolkits for testing and avoids the error propagation problem faced by current pipeline approaches naturally.

## Approach

### ◆ Adversarial Generative Nets




### ◆ Our Approach




1. A Teacher Encoder learns golden entity representations
2. A Student Encoder learns raw text representations
3. An Adversarial Discriminator discriminates the teacher and the student
4. An Event Classifier predicts the final event types.

## Experiments & Results

◆Experimental Results

| Setting | Model | P | R | $F_1$ |
|---|---|---|---|---|
| Golden | *CNNED*‡ | 71.8 | 66.4 | 69.0 |
| | *ArgATT*‡ | 78.0 | 66.3 | 71.7 |
| | *Teacher* | 76.8 | 72.9 | 74.8 |
| Predicted | *CNNED*‡ | 71.9 | 63.8 | 67.6 |
| | *ArgATT* | **76.1** | 66.0 | 70.7 |
| | *Teacher* | 72.4 | 68.9 | 70.6 |
| Adv | *Student-Final* | 73.4 | **69.1** | **71.2** |

◆ Visualization: