

# Cross-Domain Sentiment Classification with Target Domain Specific Information

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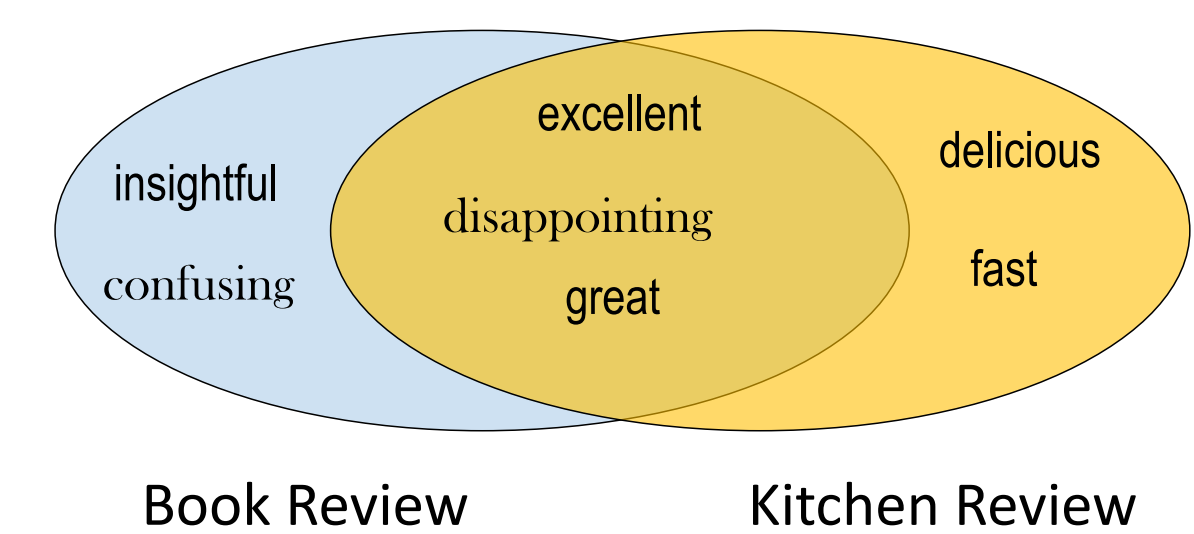
## Introduction

In this work, we try to explore a path to use the target domain specific information with as few as possible target labeled data. Specifically, we first extract the domain invariant and domain specific features of target domain data. Then, we treat these two spaces as two different views of the target domain data and accordingly train a domain invariant classifier and a target domain specific classifier. Because the domain invariant space is compatible with both source data and target data, we train the domain invariant classifier with both source and target labeled data. And for the target domain specific classifier, we train it with target labeled data only. Based on these two classifiers, we perform co-training on target unlabeled data, which can further improve the usage of target data in a bootstrap style.

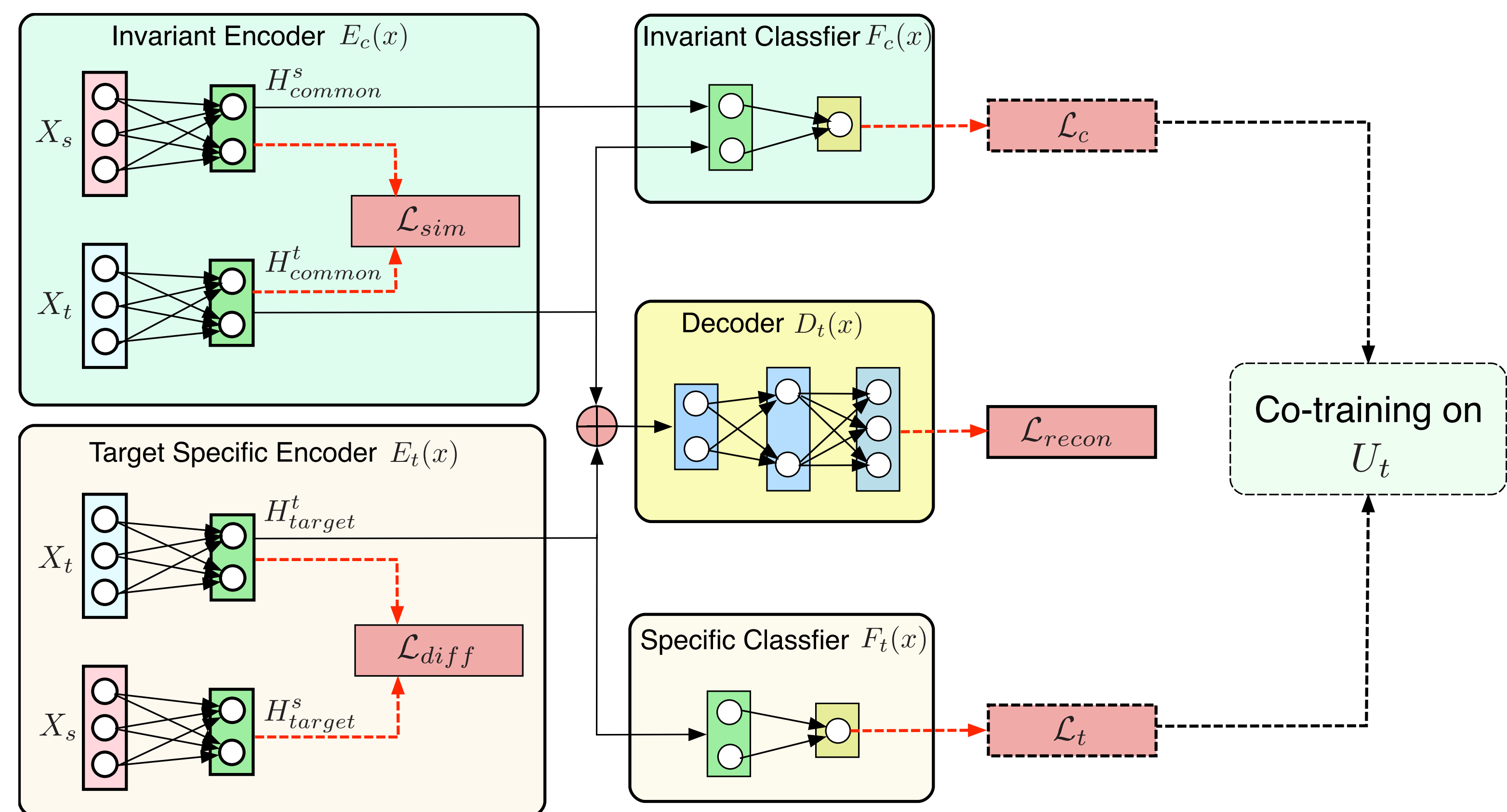
## Affiliation



## Thumbnail



## Methods



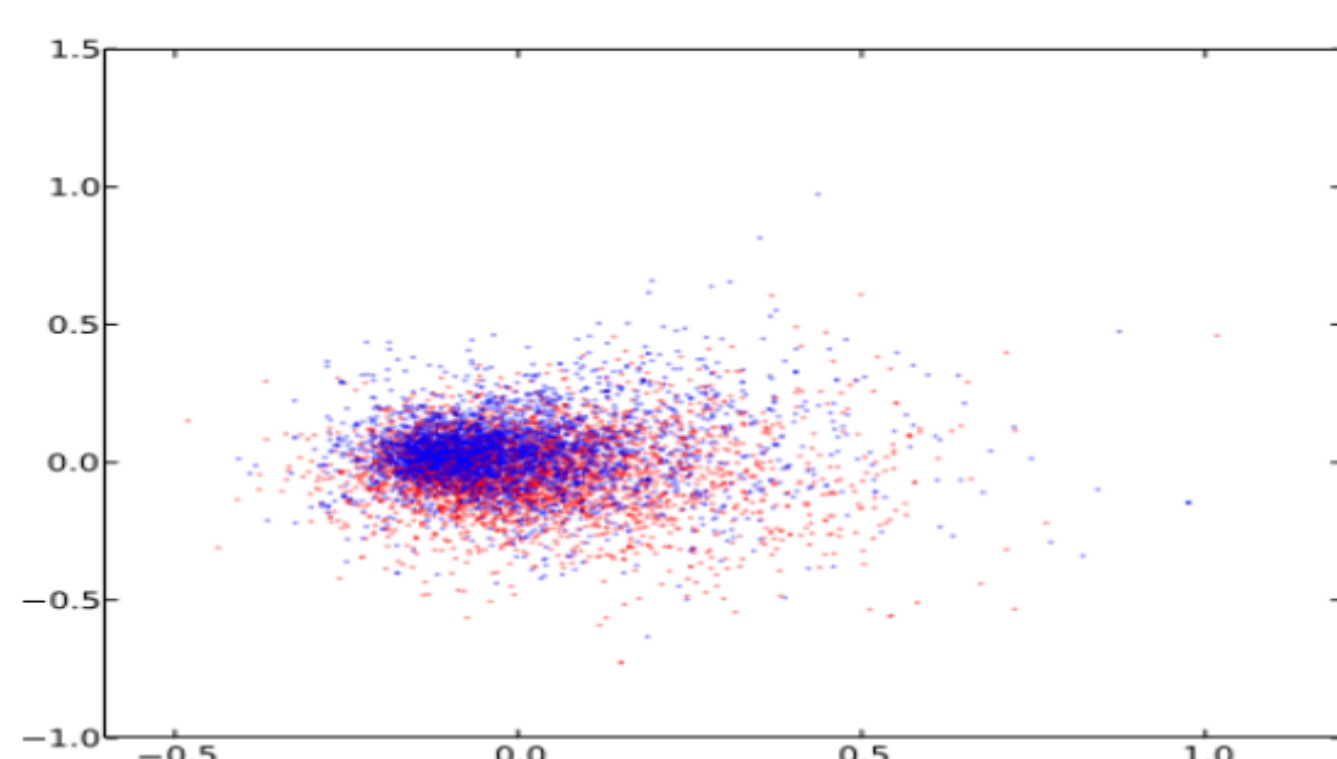
## Pseudocode

1. Extract domain invariant and target domain specific representation.
2. Train classifier  $F_c$  on invariant representation with **source and target** labeled data.
3. Train classifier  $F_t$  on target domain specific representation with **target** label data only.
4. Co-training  $F_c$  and  $F_t$  on target domain unlabeled data  $U_t$ .

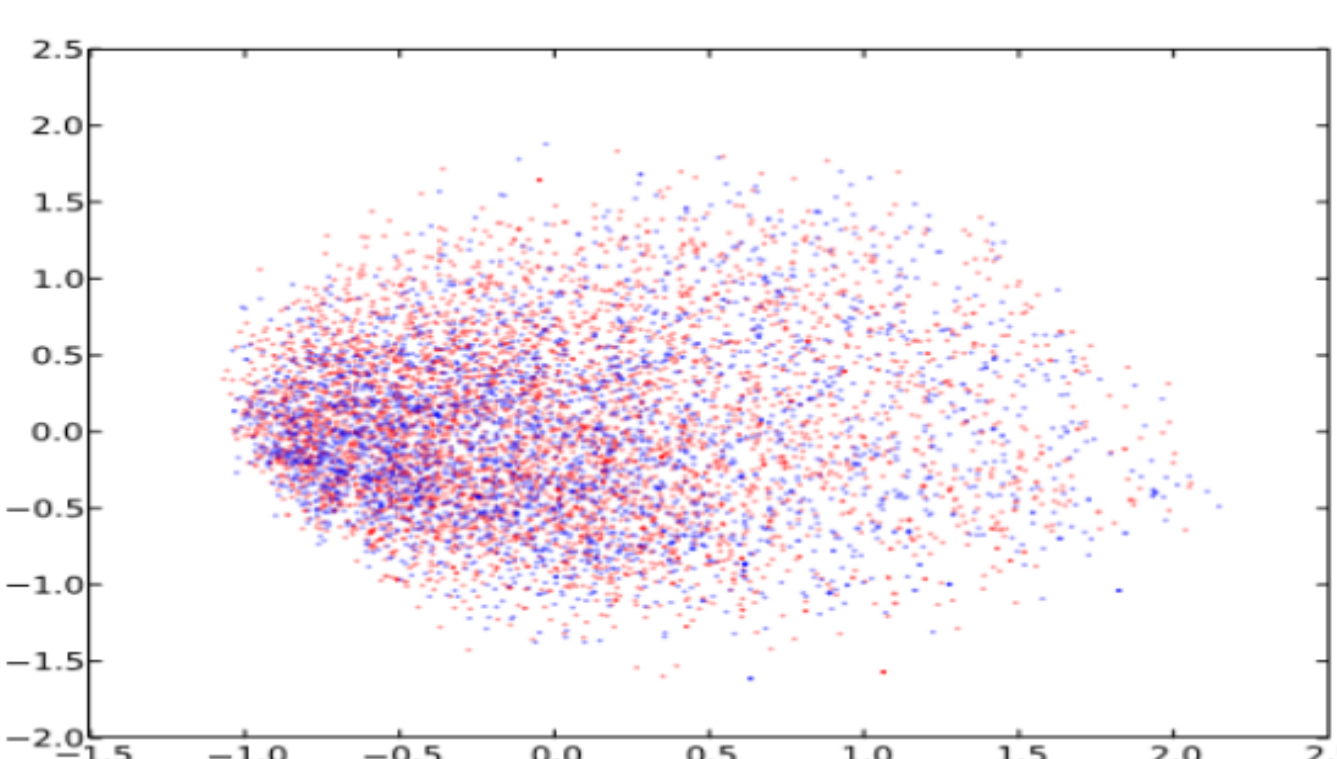
## Results

S→T	Supervised Transfer		Unsupervised Transfer		Semi-supervised Transfer			
	SO	ST	CMD	DSN	CMD+ft	DSN+ft	CODA	CoCMD (p-value)
B→D	81.7±0.2	81.6±0.4	82.6±0.3	82.8±0.4	82.7±0.1	82.7±0.6	81.9±0.4	<b>83.1±0.1</b> (.003)
B→E	74.0±0.6	75.8±0.2	81.5±0.6	81.9±0.5	82.4±0.6	82.3±0.8	77.5±2.0	<b>83.0±0.6</b> (.061)
B→K	76.4±1.0	78.2±0.6	84.4±0.3	84.4±0.6	84.7±0.5	84.8±0.9	80.4±0.8	<b>85.3±0.7</b> (.039)
D→B	79.5±0.3	80.0±0.4	80.7±0.6	80.1±1.3	81.0±0.7	81.1±1.2	80.6±0.3	<b>81.8±0.5</b> (.022)
D→E	75.6±0.7	77.0±0.3	82.2±0.5	81.4±1.1	82.5±0.7	81.3±1.2	79.4±0.7	<b>83.4±0.6</b> (.019)
D→K	79.5±0.4	80.4±0.6	84.8±0.2	83.3±0.7	84.5±0.9	83.8±0.8	82.4±0.5	<b>85.5±0.8</b> (.055)
E→B	72.3±1.5	74.7±0.4	74.9±0.6	75.1±0.4	76.2±0.6	76.3±1.4	73.6±0.7	<b>76.9±0.6</b> (.094)
E→D	74.2±0.6	75.4±0.4	77.4±0.3	77.1±0.3	77.7±0.7	77.1±1.1	75.9±0.2	<b>78.3±0.1</b> (.079)
E→K	85.6±0.6	85.7±0.7	86.4±0.9	87.2±0.7	86.7±0.3	87.1±0.9	86.1±0.4	<b>87.3±0.4</b> (.093)
K→B	73.1±0.1	73.8±0.3	75.8±0.3	76.4±0.5	76.4±0.5	76.2±0.3	74.3±1.0	<b>77.2±0.4</b> (.016)
K→D	75.2±0.7	76.6±0.9	77.7±0.4	78.0±1.4	78.8±0.4	78.5±0.5	77.5±0.4	<b>79.6±0.5</b> (.039)
K→E	85.4±1.0	85.3±1.6	86.7±0.6	86.7±0.7	<b>87.3±0.3</b>	87.2±0.4	86.4±0.5	87.2±0.4(.512)

Source-only



CoCMD: Invariant



CoCMD: Specific

