

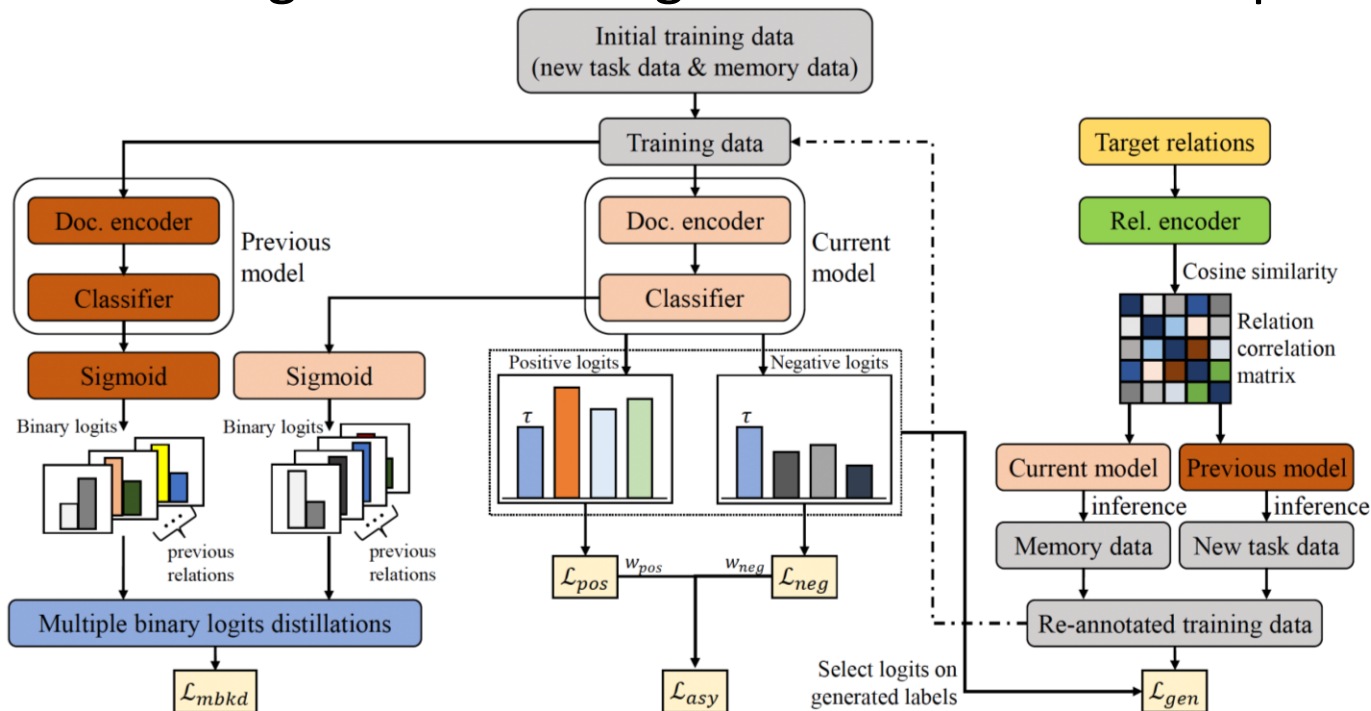
# Continual Document-Level Relation Extraction with Partial Labeling Compensation

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# Problems & Ideas

- Problems of conventional continual relation extraction methods
  - Existing works focus only on sentence-level relation extraction
  - Partial labeling of past and future relations severely degrades performance
- Ideas: A continual document-level relation extraction framework with multi-binary knowledge distillation, asymmetric training, and correlation-augmented label generation to alleviate partial labeling



Multi-Binary Knowledge Distillation

Asymmetric Training

Correlation-Augmented Label Generation

Proposed CDRE framework. Left: Multi-binary knowledge distillation. Middle: Asymmetric training between positive and negative samples. Right: Correlation-augmented label generation for new task data and memory data.

# Main Contributions

- Contributions
  - A novel continual document-level relation extraction task that captures cross-sentence relations under dynamic, task-specific annotation settings
  - A unified framework with multi-binary knowledge distillation, asymmetric training, and correlation-augmented label augmentation to alleviate partial labeling across tasks
  - An integrated strategy to enhance relation prediction for both learned and emerging relations, achieving strong performance on realistic benchmarks

Models	DocRED					ReDocRED				
	$T_1$	$T_2$	$T_3$	$T_4$	$T_5$	$T_1$	$T_2$	$T_3$	$T_4$	$T_5$
Finetuning	56.71	35.42	24.60	19.35	17.20	66.73	42.75	29.08	25.18	19.71
Joint-training	56.72	59.03	59.40	59.46	60.15	66.75	70.27	71.38	72.35	72.82
DREEAM	56.71	48.89	<u>41.72</u>	34.81	30.64	66.31	55.67	45.34	35.44	31.38
AA	<u>56.72</u>	<u>49.49</u>	41.36	35.85	30.97	<u>66.75</u>	<u>56.83</u>	<u>48.91</u>	36.45	31.85
CEAR	53.42	45.74	37.73	32.03	29.98	61.34	52.26	41.25	32.22	26.92
InfoCL	53.12	46.93	40.93	<u>35.91</u>	<u>31.68</u>	62.68	53.21	43.11	34.15	28.79
SCKD	53.03	45.67	37.65	32.14	29.87	61.24	52.13	41.36	32.12	26.84
SpanKL	56.45	33.91	33.16	32.57	29.78	65.80	40.74	38.94	<u>36.56</u>	<u>31.94</u>
<b>CDRE</b>	<b>56.74</b>	<b>55.84</b>	<b>55.57</b>	<b>54.71</b>	<b>54.55</b>	<b>66.82</b>	<b>67.83</b>	<b>67.94</b>	<b>68.41</b>	<b>68.69</b>

F1 scores on the DocRED and ReDocRED benchmarks. CDRE performs significantly better than all competitors with a large margin on the two benchmarks, except for joint-training.