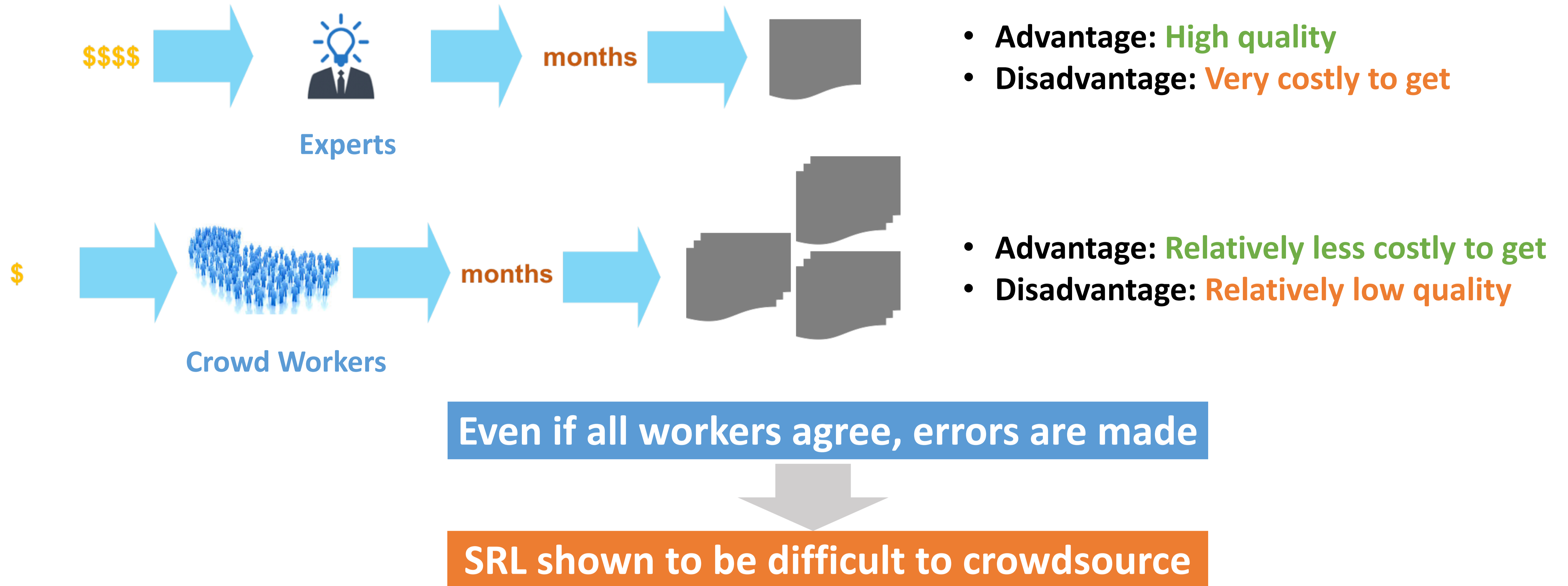
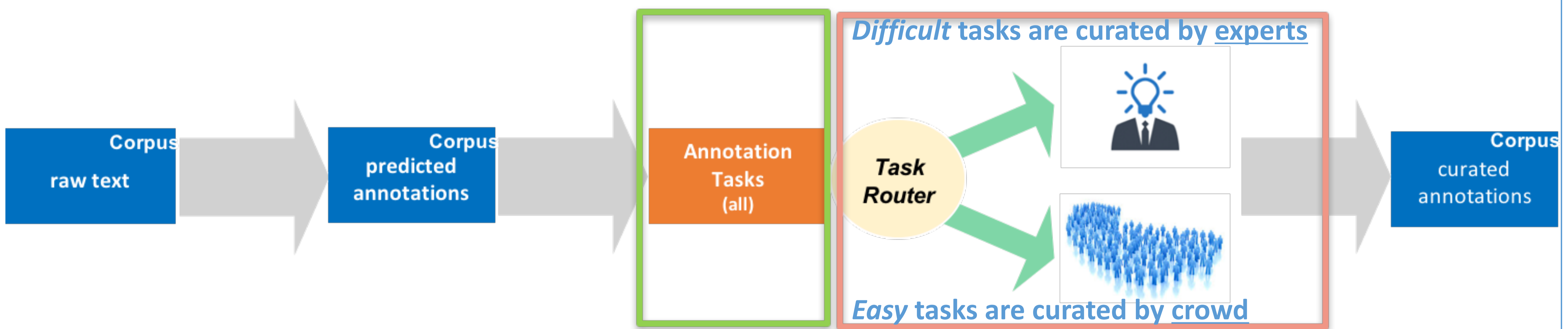


Crowd-in-the-Loop: A Hybrid Approach for Annotating Semantic Roles

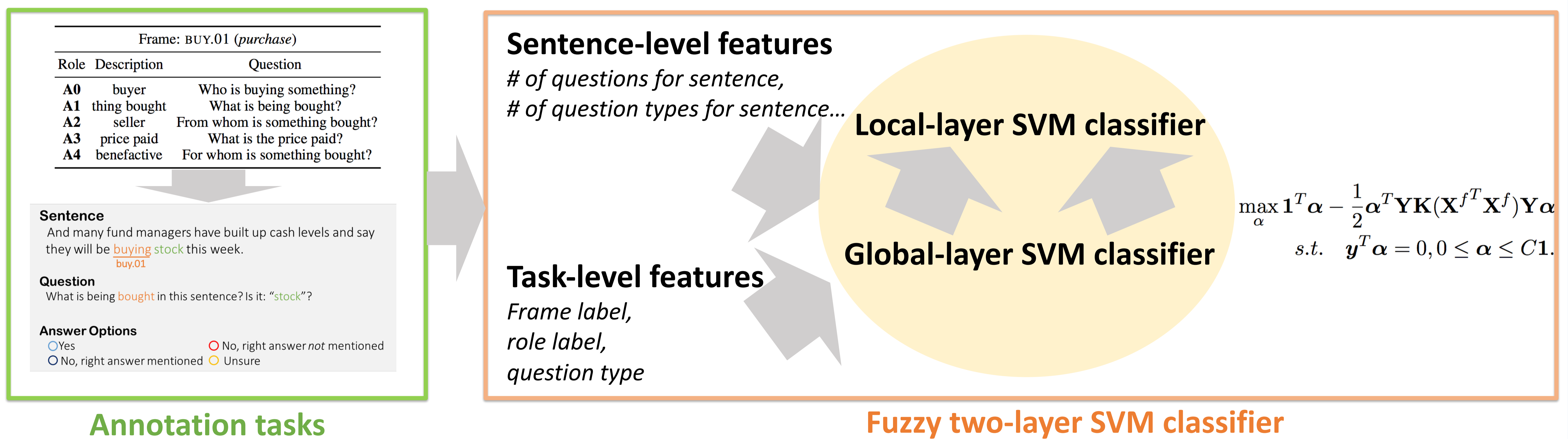
Chenguang Wang, Alan Akbik, Laura Chiticariu, Yunyao Li, Fei Xia, and Anbang Xu



Crowd-in-the-Loop Learning



Task Router Classifier



Approach	ANNOTATION QUALITY			WORKLOAD		CORRECTNESS	
	P	R	F1	crowd	expert	crowd-only	hybrid
Baseline without curation	0.86	0.83	0.85	0%	0%	-	-
CROWD _{min3}	0.92	0.88	0.90	100.0%	0%	0.84	0.84
CROWD _{min4}	0.89	0.85	0.87	100.0%	0%	0.84	0.84
CROWD _{all5}	0.87	0.84	0.85	100.0%	0%	0.84	0.84
HYBRID _{min3}	0.90	0.86	0.88	100.0%	2.2%	0.84	0.84
HYBRID _{min4}	0.91	0.87	0.89	100.0%	9.9%	0.84	0.86
HYBRID _{all5}	0.93	0.89	0.91	100.0%	27.3%	0.84	0.88
CROWD-IN-THE-LOOP _{Random}	0.92	0.88	0.90	66.4%	33.6%	0.83	0.89
CROWD-IN-THE-LOOP _{TaskRouter}	0.96*	0.92*	0.94*	66.4%	33.6%	0.92*	0.95*

Results

- Crowd-in-the-Loop tradeoff Quality and Cost!**
- +9% F1 improvement
 - 66.4% expert efforts