

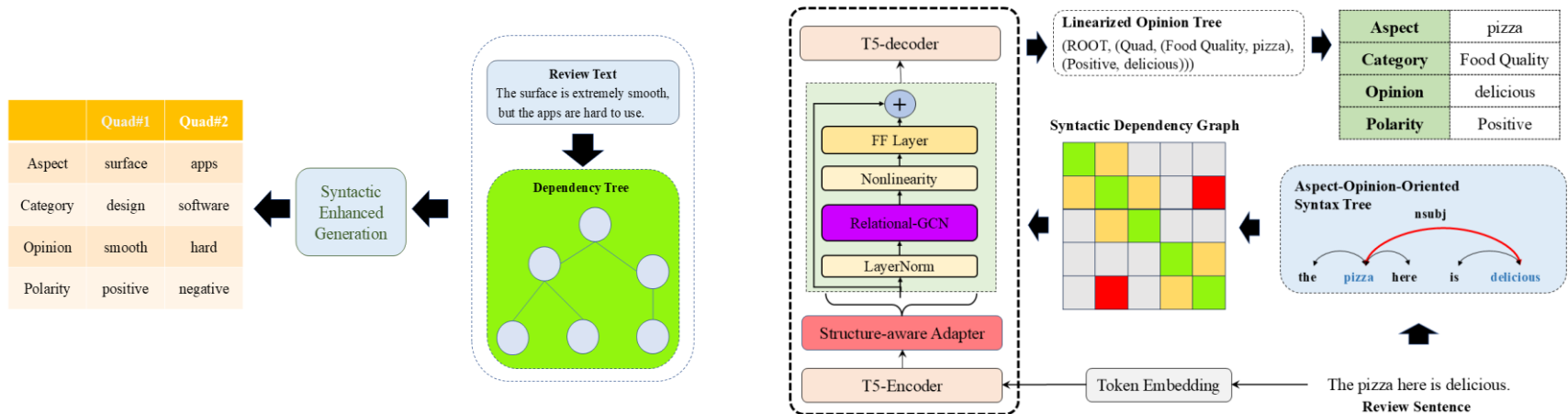
Enhancing Aspect Sentiment Quad Prediction with Syntactic Information in Generation Model

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Frontiers of Computer Science, DOI: [10.1007/s11704-025-40940-1](https://doi.org/10.1007/s11704-025-40940-1)

Problems & Ideas

- Utilizing pre-trained generation models for predicting sentiment elements has recently shown significant advancements in aspect sentiment quad prediction benchmarks. However, these models overlook the significance of syntactic information.
- Ideas: In this study, we propose an innovative structure-aware framework that explicitly encodes the syntactic structure into the pre-trained generation model while preserving its original distributional knowledge.



Overview of SEG model. Different from previous studies, SEG first extract the syntactic information from aspect-opinion-oriented syntax tree and then specifically encode the syntactic structure into generation model by structure-aware adapter module and generate all aspect-level sentiment quadruples in a unified manner.

Main Contributions

- Contributions:
 - We first propose an aspect-opinion-oriented syntax tree specifically designed for ASQP;
 - Furthermore, we introduce a novel structure-aware adapter to explicitly encode syntactic information into the generation model without altering its original knowledge acquired during pre-training;
 - The structure-aware adapter operates through layered modules that extract and utilize knowledge from pre-trained transformer layers for graph-structure encoding.

Table 4 Overall performance of different methods on the three datasets.

Method	Restaurant			Laptop			Phone		
	P.	R.	F1.	P.	R.	F1.	P.	R.	F1.
JET	0.5981	0.2894	0.3901	0.4452	0.1625	0.2381	0.3845	0.2213	0.2809
TAS-BERT	0.2629	0.4629	0.3353	0.4715	0.1922	0.2731	0.3453	0.2207	0.2693
Extract-Classify	0.3854	0.5296	0.4461	0.4556	0.2948	0.3580	0.3128	0.3323	0.3223
Paraphrase	0.5898	0.5911	0.5904	0.4177	0.4504	0.4334	0.4672	0.4984	0.4832
GAS	0.6069	0.5852	0.5959	0.4160	0.4275	0.4217	0.5072	0.4815	0.4940
DLO	0.5904	0.6029	0.5966	0.4359	0.4367	0.4363	0.5451	0.5173	0.5308
ILO	0.6071	0.6128	0.6099	0.4359	0.4297	0.4319	0.5307	0.5185	0.5245
Seq2Path	0.6029	0.5961	0.5995	0.4448	0.4375	0.4411	0.5263	0.4994	0.5125
OTG	0.6191	0.6085	0.6164	0.4395	0.4383	0.4394	0.5302	0.5659	0.5474
One-ASQP	0.6591	0.5624	0.6069	0.4380	0.3954	0.4156	0.5742	0.5096	0.5400
OTP	0.7113	0.5608	0.6271	0.4512	0.3791	0.4120	0.5916	0.4928	0.5377
ChatGPT	0.5014	0.3625	0.4207	0.4492	0.3123	0.3541	0.4812	0.4671	0.4740
LLaMA-3	0.5963	0.6097	0.6029	0.4251	0.4367	0.4308	0.5240	0.5259	0.5249
SEG	0.6374	0.6255	0.6313	0.4528	0.4609	0.4568	0.5415	0.5726	0.5567

Overall performance of different methods on the three datasets.