Self introduction and future plans

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Basic information

- I'm from Suzhou, Jiangsu.
- I got my bachelor's degree at Nanjing University of Information Science & Technology and currently a master degree candidate of science in Zhejiang Gongshang University.
- My github page is `https://github.com/LEOXC1571` and my personal blog is `https://leoxc1571.github.io/`

Honors

- 2018 National English Competition for College Students - First Prize
- The 18th China Post-graduate Mathematical Contest in Modeling - Third Prize.
- The 5th National Post-graduate Case Competition for Applied Statistics - Third Prize
- Zhejiang Gongshang University Graduate Academic Scholarship - First Prize

A fairness-aware graph contrastive learning recommender framework for social tagging systems

- The proposed method integrates contrastive learning into tag-aware recommender systems. By perturbing features with normalized noises, different perspectives on features are generated. They help the model learn high quality features via contrastive learning tasks.
- In order to promote fairness of recommendations, we introduce fairness-aware learning, which jointly optimizes TAGCL through negative tag loss and TransT regularization. Negative tag loss leverages the distribution difference between items and tags in the training data.
- TransT regularization is also propsosed to promote consistency between two bipartite graphs. The differences between tag embeddings in separate graphs are regarded as relations between users and items.

A fairness-aware graph contrastive learning recommender framework for social tagging systems

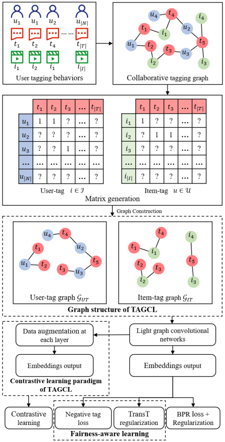

图 1: Overall structure of TAGCL

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Table 3
Performance Comparison.

Dataset	Metric	General		Tag-aware			TAGCL	imp. SOTA	imp. TRS
		LGCN	SimGCL	BPR-T	TGCN	LFGCF			
ML	Rec.	0.2788	0.2857	0.2826	0.2774	0.2929	**0.3180**	8.57%	8.57%
	Pre.	0.0349	0.0385	0.0365	0.0351	0.0365	**0.0405**	5.19%	10.96%
	NDCG	0.2015	0.2279	0.2209	0.2147	0.2140	**0.2338**	2.59%	5.84%
	MRR	0.2101	**0.2372**	0.2273	0.2202	0.2183	0.2356	-0.67%	3.65%
	ARP	26.78	17.87	22.76	19.87	18.10	**14.96**	16.26%	17.29%
LFM	Rec.	0.4742	0.5055	0.4759	0.4663	0.5057	**0.5199**	2.81%	2.81%
	Pre.	0.1350	0.1534	0.1374	0.1313	0.1465	**0.1611**	5.02%	9.97%
	NDCG	0.4015	0.4680	0.4358	0.4149	0.4482	**0.4949**	5.75%	10.42%
	MRR	0.4598	0.5263	0.5132	0.4727	0.5033	**0.5541**	5.28%	7.97%
	ARP	114.46	51.67	102.84	80.76	80.65	**42.99**	16.79%	46.70%
DE	Rec.	0.3337	0.3351	0.3150	0.3158	0.3300	**0.3432**	2.42%	4.00%
	Pre.	0.3525	0.3554	0.3409	0.3407	0.3498	**0.3705**	4.25%	5.92%
	NDCG	0.4213	0.4177	0.3984	0.4044	0.4080	**0.4385**	4.08%	7.48%
	MRR	0.5786	0.5529	0.5373	0.5577	0.5395	**0.5828**	0.73%	4.45%
	ARP	**3.11**	4.67	6.32	7.25	4.69	5.61	-79.99%	-19.62%

Pursuit and Evasion Strategy of a Differential Game Based on Deep Reinforcement Learning

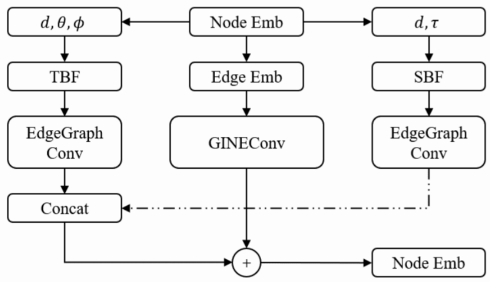
- For the kinematic solve of dog sheep game, by finding the equilibrium point in the game, this study successfully establishes the kinematic pursuit and evasion policies.
- Leverage DQN and DDPG models to train the escaping strategy for intelligent agents.
- Propose a refined reward mechanism and an attenuation mechanism to minimize the defect of DQN.

Internship at Zhejiang Lab

- Working at the research center of graph computing, leading by Hongyang Chen.
- Investigate, survey, and repreduce some state-of-the-art large-scale molecular pretraining methods, including MPG, Grover, GEM, MolCLR, and etc.
- Compete in OGB-LSC NeurIPS 22, and achieve 11th place at PCQM4M-V2 track.
- Write a survey on diffusion-based graph generative methods.
- Propose a diffusion-based 3D molecule generation method.

OGB-LSC NeurIPS 22

- Propose HFAGNN for large-scale (over 3M) molecular property predictions.
- Build up the hybrid block that combines topology and geometry information together. Bessel function is adopted to extract pair-wise and triplet-wise geometric information.
- Use multi-gpu training and achieve 11th place of the leaderboard.



Diffusion-based molecule generation

- Build up a framework for de novo molecule generation.
- Deisgn the E(n) dual-track denoising kernel for effective molecular learning.
- The atom-pair track predicts the influence of inter-atomic forces on atom coordinates and atomic numbers via global Transformer. Then the pair-wise features get updated by the same structure, which incorporates triplet angle information into pair-wise features.
- Build up a loss function that facilitate correct valencies of atoms.

Future plans

- Graph generative methods: There are some challenges of diffusion-based graph generation, such as difficulties casued by the discrete nature of graphs, efficient training objective and evaluation metrics, relatively limited application fields, and out-of-distribution generation.
- Graph generation combined with large pretrained models, graph learning in other application fields, conditioned or out-of-distribution learning, and etc.

Thanks!