Xiaohan Zou

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Education

Boston University   Boston, MA
M.S. in Computer Science   09/2021 - 01/2023
Tongji University   Shanghai, China
B.Eng. in Software Engineering   09/2016 - 07/2020

Publications and Preprints

- **TokenFlow: Rethinking Fine-grained Cross-modal Alignment in Vision-Language Retrieval**
  Xiaohan Zou, Changqiao Wu, Lele Cheng, Zhongyuan Wang
  Preprint, 2022
- **Efficient Meta-Learning for Continual Learning with Taylor Expansion Approximation**
  Xiaohan Zou, Tong Lin
  International Joint Conference on Neural Networks (IJCNN), 2022 **(Oral)**
- **To be an Artist: Automatic Generation on Food Image Aesthetic Captioning**
  Xiaohan Zou, Cheng Lin, Yinjia Zhang, Qinpei Zhao
  International Conference on Tools with Artificial Intelligence (ICTAI), 2020 **(Oral)**
- **A Survey on Application of Knowledge Graph**
  Xiaohan Zou
  International Conference on Control Engineering and Artificial Intelligence (CCEAI), 2020

Professional Experience

Machine Learning Engineer Intern   07/2021 - 04/2022
Kuaishou Technology   Beijing, China

- Devised a new model-agnostic formulation for fine-grained cross-modal semantic alignment and subsumed the recent popular works into the proposed scheme
- Proposed a simple but effective fine-grained video-text retrieval method that achieves better or on-par performance against the SoTA approaches with heavy model design by only altering the similarity function
- Developed a PyTorch library for video-text retrieval which is benefiting the group members' research work

Research Experience

Meta-Learning for Continual Learning   08/2020 - 01/2022
Peking University (Advisor: Prof. Tong Lin)   Beijing, China

- Designed an efficient method for parameter importance estimation via Taylor expansion
- Proposed a fast meta-learning algorithm for continual learning problems, which expresses the gradient of meta-update in closed-form instead of using Hessian information, **published in IJCNN 2022 (oral)**
- Outperformed SoTA methods while optimizing much more efficient in experiments on popular benchmarks

Personalized Product Description Generation   06/2021 - 08/2021

- Incorporated user information to T5 pre-trained language model using bidirectional attention to generate personalized descriptions for target users
- Designed a transformer to make use of the external knowledge extracted from a structural knowledge graph for providing informative product descriptions
- Won the champion of the language track in Deecamp 2021

Food Image Aesthetic Captioning 03/2020 - 06/2020

Tongji University (Advisor: Prof. Qinpei Zhao) Shanghai, China

- Proposed a novel framework consisting of a single-attribute captioning module and an unsupervised text summarization module for generating aesthetic captions for food images, **published in ICTAI 2020 (oral)**
- Designed a data filtering strategy inspired by TF-IDF method for building a dataset for this new task
- Introduced two new evaluation criteria to assess the novelty and diversity of the generated captions
- Outperformed baselines and existing methods substantially in terms of diversity, novelty, and coherence

Fault Diagnosis for Microservice Architectures 09/2018 - 01/2019

Tongji University (Advisor: Prof. Qingfeng Du) Shanghai, China

- Represented the microservices of a cloud platform and the causal relationships between them by a Bayesian network against the observed performance metrics dynamically using PC algorithm
- Identified the culprit microservices when an anomaly occurred using random walk
- Outperformed traditional approaches with 6.56% accuracy improvement without knowing the calling graph

Semi-Supervised Machine Translation 07/2018 - 08/2018

Peking University (Advisor: Prof. Tong Lin) Beijing, China

- Proposed a dual learning framework based on shared hidden space to utilize the structure duality to boost the learning of two dual tasks and better regularize the model
- Designed two denoising auto-encoders consisting of encoders and decoders of two traditional Seq2Seq neural machine translators to make use of unpaired data
- Outperformed strong baselines by 1.0 - 2.9 BLEU on IWSLT'15 (English-Vietnamese) and WMT'14 (English-German), the improvement is more obvious when labeled data is little

Awards and Honors

Champion of Language Track, Deecamp 2021

Bronze, China Collegiate Programming Contest (CCPC) 2018

Finalist, ACM International Collegiate Programming Contest (ICPC) Asia Regional 2018

Second Prize, Tongji University Programming Contest 2017, 2018

Second Prize, China Mathematical Contest in Modeling (CUMCM) 2017, 2018

Second Prize, East China Normal University Programming Contest 2017

Core Courses

Machine Learning: Machine Learning, Image and Video Computing, Computational Tools for Data Science
Mathematics: Probability and Mathematical Statistics, Calculus, Linear Algebra, Discrete Mathematics

Skills

Programming Languages: Python, JavaScript/TypeScript, HTML/CSS, Java, C/C++
Tools and Frameworks: Git, PyTorch, Keras, scikit-learn, NumPy, Linux, Vue, React, Django, LaTeX
Languages: Chinese (native), English (proficient, TOEFL: 106, GRE: 322)