

ICASSP '25 notes and interesting posters

Benedikt Kantz

April 16, 2025

1 Montag Vormittag

1.1 Tutorial: Generative AI and Model Optimization

Problem: (compute) cost, current foundation models not sustainable Solutions:

1.1.1 Sparsity

- scalability, less overfitting, interpretability, adaptive ways to introduce sparsity
- post training: optimal brain damage (OBD)/ optimal brain surgery (OBS)
 - dropout by contribution to error, scale by Hessian \mathcal{H} contribution
- training:
 - L1-loss: Convex optim.; no free lunch: initial model very large!, more eqs.
 - exhaustive: very expensive
 - greedy/evolutionary solutions: StOMP, GOMP based on L0-norm, but very effective
- pre-training
 - SET
 - randomly initial init → evolutionary
- architectural: grow and shrink networks...

Problem: doesn't really work with LMs (empirical study), but well for other networks (esp. low-weight dropout)

1.1.2 Compression

- filter: storage compression
- low rank factorization (\neq LoRA), during train time not fine-tuning
- knowledge distillation

2 Dienstag Nachmittag

2.1 Talk: Underwater Communications

- Problem: very slow comm underwater, ≈ 10 kHz range
- Towards moving target, Doppler correction using active SP correction, very manual work

Comment: interesting manual process, tedious work to sample

3 Mittwoch Nachmittag

3.1 Talk: AI+SP

Comment: not great, just some basics on diffusion/transfomers, a little bit of SP in NNs - not exciting

4 Donnerstag Vormittag

4.1 Talk: Multiomics

- Genomics: DNA understanding
- Transcriptomics: DNA- $\&$ RNA understanding
- Proteomics: RNA- $\&$ Protein structures
- Knowledge graphs: how do these systems influnce each other
- Flow:
 - identify DNA mutation that triggers illness
 - find possible RNA mechanism
 - find good fitting small ring structure
 - check for side effects in knowledge graph! (certain protein effects unwanted)
 - then test → animal tests, reduce through ML!
- Graph diffusion for drug discovery: noise schedule for diffusion essential, i.e. cosine-square schedule
 - diffuse graphs from atoms & edges as adjacency matrix
 - what is noise: discrete noise: each atom is discrete state \Rightarrow graph structure undergoes state transition change
 - naive: uniform structure, not really chemically sensible - conditional probabilities \Rightarrow not uniform but marginal distribution of molecules in training (just logical!), same for edge (with deletion!)
 - one step further: consider carbon rings, restriction based on maximum bonds of atom (freie Radikale)
 - SMILE-file, QED: Quantitative Estimate of Drug likeness (from RDKit)
 - Existing methods: Time-consuming, progress slow, very few good molecules
 - Their work: jointly perturb rings+nodes
 - other approaches: motives as super-node with rings, difficulty: ring attachments - only $\approx 1\%$ improvement!
 - novelty however high, one molecule of them even patented!
- Knowledge graphs:
 - GNN link prediction
 - none of the existing benchmarks include features!
 - maybe talk to author!

Comment: focused on drug discovery using diffusion, not much on multiomics...

5 Lectures/Orals

Table 1:

Lecture	URL	Notes
Diversity-Seeking Techniques for Red-Teaming LLMs	https://ieeexplore.ieee.org/document/10890844/	Add RL-Loss to train similar to GAN by backpropagating if the model returns very similar output (i.e. discriminator)-; Very fragile learning; Limited further studies
FDR Control for Complex-Valued Data	https://ieeexplore.ieee.org/document/10889705	similar to LASSO; sparsifying system under certain guarantees
SpectralCam: High-Resolution Low-Cost Spectral Imaging Using DSLR Cameras	https://ieeexplore.ieee.org/document/10887725	Interesting concept of applying photo filter to DSLR sensor, Bayesian pattern restoration "learned" using diffusion & attenuation mtx
Fusing Multimodality of Large Language Models and Satellite Imagery	https://ieeexplore.ieee.org/document/10889624	Could be interesting in combination with HEREDITARY geospatial data once we have access
Controllable Forgetting Mechanism for Few-Shot Class-Incremental Learning	https://arxiv.org/pdf/2501.15998	Using embedding space to classify, add new classifier based on distance, seems rather hyperparameter-sensitive

6 Posters

Table 2:

Poster	Information																																				
<p>PD-VOST: PARKINSON'S DISEASE VOICE SPECTROGRAM TRANSFORMER Ilias Tougui, Mehdi Zakroum, Ouassim Karakchou, Mounir Ghogho International University of Rabat, Morocco April 06 - 11, 2023 HICC (Hyderabad International Convention Center) Hyderabad, India</p> <p>Background • Parkinson's disease (PD) affects over 10 million people worldwide [1] • PD patients often experience voice and speech changes such as [2]:</p> <ul style="list-style-type: none"> - End-to-end processing: >10 seconds waveform recorded for entire duration. - Converter to 128-dimensional Mel-spectrograms (25ms Hamming window, 10ms step). - Final spectrogram size: 128 x 1007. - Data augmentation: Time and frequency warping. <p>Motivation • Experts achieve an accuracy of 84% after clinical diagnosis [3]. • Access to specialists is limited.</p> <p>Limitations • Previous ML studies rely on hand-crafted features.</p> <p>Methodology • Data obtained from mPower Study: 1963 PD patients, 1478 healthy controls. • Standardized recordings of voice (n = 10s)</p> <p>Methodology • Record-wise split: Recordings from the same person may appear in both sets.</p> <p>Results • Model-wise split: Recordings from different speakers.</p> <p>Prediction Aggregation (per subject) • AUC: Measures model's ability to distinguish between classes.</p> <p>Performance Metrics • AUC: Measures model's ability to distinguish between classes.</p> <p>Results • AUC: Measures model's ability to distinguish between classes.</p> <p>Conclusion • Project VOST: A voice-based PD diagnostic tool.</p> <p>Fig. 1: Training and Validation Losses of ViT and AST Model. The AUC is 0.915.</p> <p>Fig. 2: Confusion Matrix of The Model Using Different Testing Strategies. The Overall Accuracy is 91.5%.</p> <p>Fig. 3: Performance Metrics of The Model Using Different Testing Strategies. The Overall Accuracy is 91.5%.</p> <p>Fig. 4: Comparison of model performance according to the number of training samples. The overall accuracy is 91.5%.</p>	<p>PD-VOST: Parkinson's Disease Voice Spectrogram Transformer <i>Ilias Tougui, Mehdi Zakroum, Ouassim Karakchou, Mounir Ghogho</i> https://ieeexplore.ieee.org/abstract/document/10889820/</p>																																				
<p>What Does an Audio Deepfake Detector Focus on? A Study in the Time Domain Gaurav Rathi, Surya, Gauravia Roatty, Reality Defender, EPFL</p> <p>Background • Deepfakes have become a major concern in the field of audio synthesis.</p> <p>Methodology • Deepfake detection based on GANs.</p> <p>Results • Adversarial evolution of hypotheses.</p> <p>Conclusion • Deepfakes are generated by learning the target speaker's voice.</p>	<p>The EPFL combinational benchmark suite <i>pee/ginbergaepf.ch, facia, surya, gauravia roatty realitydefender al</i> https://infoscience.epfl.ch/entities/publication/309aea67{-}b5a1{-}4532{-}8a6f{-}0a141d8f1ab3/full</p>																																				
<p>Latent Diffusion Bridges for Unsupervised Musical Audio Timbre Transfer Michele Manucusi, Yurii Halychanskyi, Kin Wai Cheuk, Eloi Moliner, Chieh-Hsin Lai, Stefan Uhlich, Junghyun Koo</p> <p>Background • What is Transferring? • How to transfer musical audio across domains while preserving key structure or meaning?</p> <p>Methodology • We propose an unsupervised approach for latent diffusion bridges for timbre transfer.</p> <p>Results • Metrics</p> <table border="1"> <thead> <tr> <th>Acoustic Target</th> <th>Model</th> <th>DPD</th> <th>JD</th> <th>FAO</th> <th>Auc</th> </tr> </thead> <tbody> <tr> <td>Violin</td> <td>WAVGAN</td> <td>0.61</td> <td>0.60</td> <td>0.60</td> <td>0.61</td> </tr> <tr> <td>Flute</td> <td>WAVGAN</td> <td>0.61</td> <td>0.60</td> <td>0.60</td> <td>0.61</td> </tr> <tr> <td>Drum</td> <td>WAVGAN</td> <td>0.17</td> <td>0.16</td> <td>0.16</td> <td>0.17</td> </tr> <tr> <td>Piano</td> <td>WAVGAN</td> <td>1.00</td> <td>0.99</td> <td>0.99</td> <td>1.00</td> </tr> <tr> <td>Bassoon</td> <td>WAVGAN</td> <td>1.00</td> <td>0.99</td> <td>0.99</td> <td>1.00</td> </tr> </tbody> </table>	Acoustic Target	Model	DPD	JD	FAO	Auc	Violin	WAVGAN	0.61	0.60	0.60	0.61	Flute	WAVGAN	0.61	0.60	0.60	0.61	Drum	WAVGAN	0.17	0.16	0.16	0.17	Piano	WAVGAN	1.00	0.99	0.99	1.00	Bassoon	WAVGAN	1.00	0.99	0.99	1.00	<p>Latent Diffusion Bridges for Unsupervised Musical Audio Timbre Transfer <i>Michele Manucusi, Yurii Halychanskyi, Kin Wai Cheuk, Eloi Moliner, Chieh-Hsin Lai, Stefan Uhlich, Junghyun Koo</i> https://ieeexplore.ieee.org/abstract/document/10890708/</p>
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<p>Planetary gear vibration monitoring using synchronous demodulation KU Leuven, CLMSD, MAKE IWC, RIK Visserberg, Konstantinos Gryffas</p> <p>Background • This work proposes a signal processing pipeline for the vibration-based monitoring of planetary gearboxes. The pipeline is able to detect the presence of gearboxes in various applications such as wind turbines and helicopters. This is very important for maintenance purposes.</p> <p>Methodology • The proposed pipeline consists of two main parts: feature extraction and classification.</p> <p>Results • The resulting indicator gives a clear trend with respect to the ambient temperature. This trend is also shown in other gearboxes.</p>	<p>do a crow endus ported ten band mentorine at pear enoses. The pipeline do a crow endus ported ten band mentorine at pear enoses. The pipeline</p>																																				

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Table 2: (Continued)

	<p>EFFICETH REPARAMNE outperforming models like CV-SOG, Motifs, and VCTree.</p>
	<p>MusicLiME: Explainable multimodal music understanding tasks, achieving 57.34% for genre and 48.53% for emotion Classification https://ieeexplore.ieee.org/abstract/document/10889771/</p>
	<p>OSLO-IC: On-the-Sphere Learned Omnidirectional Image Compression with Attention Modules and Spatial Context Bidgoll, Pascal Frossard?, André Kaup?, Thomas Maugey? https://ieeexplore.ieee.org/abstract/document/10889131/</p>
	<p>Exploiting the Relationship within the Unlabelled Samples by Set Matching for Generalized Category Discovery Qiubo Ma', Hang Yu%, Yuan Shan 3, Pinzhuo Tian 1 https://ieeexplore.ieee.org/abstract/document/10889522/</p>

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Table 2: (Continued)

	<p>Evaluating Contrastive Methodologies for Music Representation Learning Using Playlist Data methods [1, 2] and novel hybrid approaches https://ieeexplore.ieee.org/abstract/document/10888157/</p>
	<p>Fine-tuning and prompt optimization: Two great steps that work better together Dong Sun, Wenya Guo, Xumeng Liu, Ying Zhang*, Zhaoxiang Hou, Zengxiang Li https://arxiv.org/abs/2407.10930</p>
	<p>Digital Twin-Driven Bearing-Fault Detection in Induction Motor and Drives using Graph Sampling and Aggregation Network Haraprasad Badajena, Suryanarayan Majhi, Bivash Chakraborty, Mamata Jenamani, Aurobinda Routray, Ronit Dutta https://ieeexplore.ieee.org/abstract/document/10889484/</p>
	<p>Yi Zhu', Xiangyang Liu!?, Tianqi Pang', Xuncan Xiao!, Xiaofan Zhang33, Chenyou Fan!.* Yi Zhu', Xiangyang Liu!?, Tianqi Pang', Xuncan Xiao!, Xiaofan Zhang33, Chenyou Fan!.*</p>

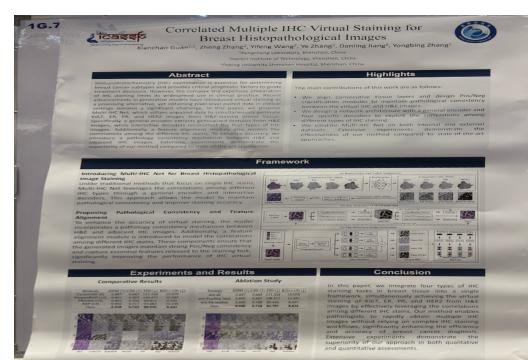
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Table 2: (Continued)

	<p>Text to music audio generation using latent diffusion model: A re-engineering of audiodlm model 1nh tonne Wegner Neteal Ponesin, Deren Hertemans, Rogger Wattenhofer https://www.diva{-}portal.org/smash/record.jsf?pid=diva2:1845150</p>																																																																		
	<p>Exploring the Distribution of Cell Subpopulations in Pancreatic Ductal Adenocarcinoma Slides by Joint Spatial Transcriptomics and Pathology Data Yagi Deng, Wenjie Cai, Bentao Song, Bin Yang, Lingming Kong, Qingfeng Wang*, Jun Huang https://ieeexplore.ieee.org/abstract/document/10890640/</p>																																																																		
	<p>Classification of Eye-Tracking Data Based on Spatiotemporal Attention Encoding Maju Hei, Chen Xia't, Kuan L, Tan Zhangt Beijing University of Chemical Technology / Northwest Polytechnical University *The Affiliated Hospital of Northwest University / **Xian Jiaotong University</p> <p>Task & Contributions Eye tracking has already played an important role in a variety of fields today, such as user interaction, game development, and medical research. Deep learning methods have been proved effective in predicting human eye movement, contributing to disease visual attention.</p> <ol style="list-style-type: none"> We propose an eye movement classification framework based on spatial features and dynamic temporal features to better reconstruct visual attention. We introduce features from a global perspective, accounting for the competitive influence of other features in the classification process. We conducted experiments on three eye tracking datasets and drew three distinct conclusions and improvements about our work model. <p>Main Experiment Results</p> <table border="1"> <thead> <tr> <th colspan="6">AID Identification (w/epoch=0)</th> </tr> <tr> <th></th> <th>AUC</th> <th>F1</th> <th>Sp</th> <th>NPC</th> <th>AUC</th> </tr> </thead> <tbody> <tr> <td>Web</td> <td>0.6412</td> <td>0.5323</td> <td>0.6310</td> <td>0.5647</td> <td>0.6412</td> </tr> <tr> <td>APM</td> <td>0.7086</td> <td>0.5868</td> <td>0.7237</td> <td>0.7870</td> <td>0.7086</td> </tr> <tr> <td>Sphere</td> <td>0.7063</td> <td>0.6556</td> <td>0.6961</td> <td>0.7462</td> <td>0.7063</td> </tr> <tr> <td>SMC</td> <td>0.8350</td> <td>0.7590</td> <td>0.7324</td> <td>0.7479</td> <td>0.8350</td> </tr> </tbody> </table> <p>Methods Overview</p> <p>Fig 1 Diagram of the spatiotemporal attention encoding model</p> <p>Framework This framework extracts spatiotemporal features from spatial (using ViT) and temporal (using enhanced GRU) features and performs sequentially encoded eye movement features, into a classifier to predict class probability.</p> <p>Enhanced GRU We introduce a global temporal modulating factor to GRU for global temporal information, which draws more global hidden states to better represent global sequence patterns, overcoming the limitations of traditional GRU's in capturing long-term dependencies.</p> <p>Fig 2 Global temporal module in the STAE model</p> <p>Ablation Study Ablation analysis of AID identification task</p> <table border="1"> <thead> <tr> <th></th> <th>AUC</th> <th>F1</th> <th>Sp</th> <th>NPC</th> <th>AUC</th> </tr> </thead> <tbody> <tr> <td>Web</td> <td>0.6412</td> <td>0.5323</td> <td>0.6310</td> <td>0.5647</td> <td>0.6412</td> </tr> <tr> <td>APM</td> <td>0.7086</td> <td>0.5868</td> <td>0.7237</td> <td>0.7870</td> <td>0.7086</td> </tr> <tr> <td>Sphere</td> <td>0.7063</td> <td>0.6556</td> <td>0.6961</td> <td>0.7462</td> <td>0.7063</td> </tr> <tr> <td>SMC</td> <td>0.8350</td> <td>0.7590</td> <td>0.7324</td> <td>0.7479</td> <td>0.8350</td> </tr> </tbody> </table> <p>Fig 3 Visualization of feature visual and with temporal modeling of visual task classification</p>	AID Identification (w/epoch=0)							AUC	F1	Sp	NPC	AUC	Web	0.6412	0.5323	0.6310	0.5647	0.6412	APM	0.7086	0.5868	0.7237	0.7870	0.7086	Sphere	0.7063	0.6556	0.6961	0.7462	0.7063	SMC	0.8350	0.7590	0.7324	0.7479	0.8350		AUC	F1	Sp	NPC	AUC	Web	0.6412	0.5323	0.6310	0.5647	0.6412	APM	0.7086	0.5868	0.7237	0.7870	0.7086	Sphere	0.7063	0.6556	0.6961	0.7462	0.7063	SMC	0.8350	0.7590	0.7324	0.7479	0.8350
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Table 2: (Continued)

 <p>Correlated Multiplex IHC Virtual Staining for Breast Histopathological Images</p> <p>Abstract</p> <p>Highlights</p> <ul style="list-style-type: none"> The main contributions of this work are as follows: We align immunohistochemical images with corresponding histopathological images. We design a network architecture to correlate multiplex IHC images. We validate our method on both simulated and real-world datasets. Our method outperforms the state-of-the-art approaches. <p>Framework</p> <p>Experiments and Results</p> <p>Conclusion</p>	<p>Virtual multiplex immunohistochemistry: application on cell block of effusion and aspiration cytology Xianchao Guan¹², Zheng Zhang^{?, Yifeng Wang[?], Ye Zhang^{?, Danling Jiang[?], Yongbing Zhang[?]}}</p> <p>https://onlinelibrary.wiley.com/doi/abs/10.1002/dc.24344</p>
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Table 2: (Continued)

	<p>Exploring the Distribution of Cell Subpopulations in Pancreatic Ductal Adenocarcinoma Slides by Joint Spatial Transcriptomics and Pathology Data Yagi Deng, M cnje Cai, Benao Song, Bin Yang, Limphing Kung , Qedeng Pung*, Jam H https://ieeexplore.ieee.org/abstract/document/10890640/</p>
	<p>NanoGen: A High-affinity Nanobody Generation Model with Guided Diffusion Dezhij Wu*, Xuejiao Liu*, Yiming Qin*, Stephanie M. Linker*, Karin Hrovatin*, Alexander V.Hopp*, Feng Tan** https://ieeexplore.ieee.org/abstract/document/10888039/</p>
	<p>ApinAPDE, a curated repository with physicochemical properties (GRAVY, net charge, isoelectric point, molecular weight). Emas: 2230112006.M.00.u.59. cong na00012e.ntu.edu.sg. as.293th@ntu.edu.5g</p>
	<p>Toward robust early detection of alzheimer's disease via an integrated multimodal learning approach Yifei Chen, Shenghao Zhu. Zhaojie Fang. Chang Liu, Binfeng Zou, Linwei Qiu, Yuhe Wang. Shuo Chang. Fan Jia, Felwel Qin*. Jin Fang. Yong Peng, Changmiao Wang https://ieeexplore.ieee.org/abstract/document/10888363/</p>

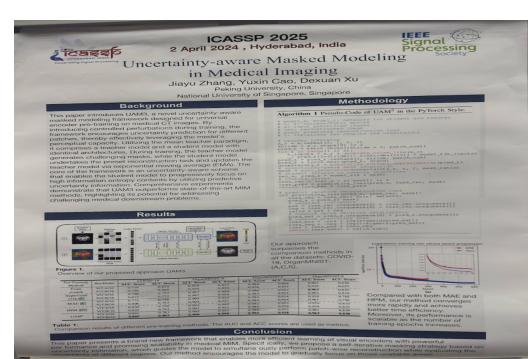
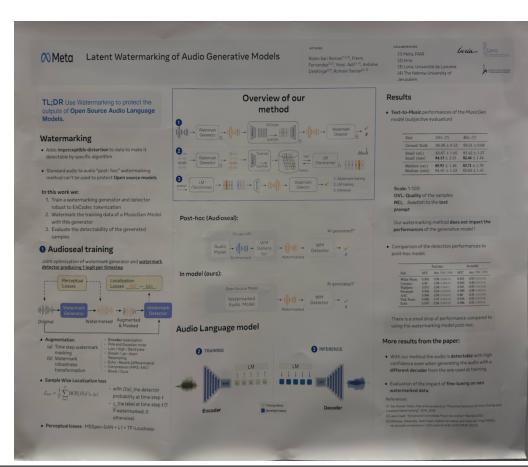
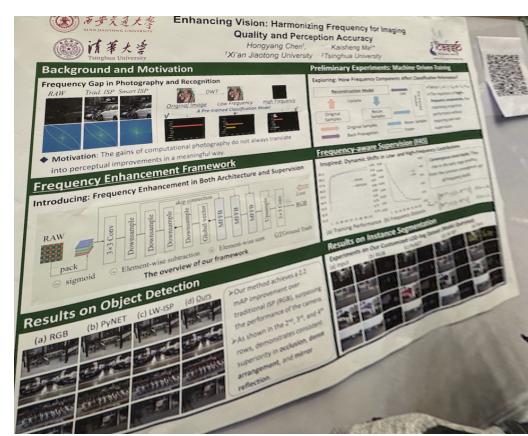
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Table 2: (Continued)

<p>Multi-Descriptor Mesh Animation Compression Bo Gao*, Changgang Fan, Gao Li, Siwei Chen, Shenzhen Graduate School, Peking University, Shenzhen, China 10th International Conference on Media, Information and Communications, Paris, France, USA Introduction LoD-Uniform Partitioning and Prediction Deep Entropy Model with Multiple Descriptors Proposed framework Experiments</p>	<p>Experiments demonstrato MD-MAC achieves 22% bitrate reduction for lossless compression and 17% BD-Rate improvement for lossy compression compared to V-DMC, with 95% faster 1Shenzhen Graduate School, Peking University, Shenzhen, China,</p>
<p>Robust Kernel Sparse Subspace Clustering Ivan Šimić, Bojan Kuzmanović, Tomislav Rupčić, Faculty of Electrical Engineering, University of Zagreb, Croatia Faculty of Computing, University of Zagreb, Croatia Institute of Mathematics and Cryptology, Polish Academy of Sciences, Warsaw, Poland Abstract Kernel sparse subspace clustering (KSSC) has been widely used in pattern recognition, including face recognition, handwritten digit recognition, and medical image analysis. These algorithms, however, are prone to outliers and noise. In this paper, we propose a robust kernel sparse subspace clustering algorithm that can handle outliers and noise. The proposed algorithm is based on a robust optimization framework, which minimizes the sum of squared distances between data points and their corresponding cluster centers. The proposed algorithm is able to handle outliers and noise by using a robust loss function. The proposed algorithm is also able to handle high-dimensional data by using a sparse representation of the data. The proposed algorithm is able to handle outliers and noise by using a robust loss function. The proposed algorithm is also able to handle high-dimensional data by using a sparse representation of the data.</p>	<p>Robust Kernel Sparse Subspace Clustering da cesta 54, P.O. Box 180, 10002 Zagreb, Croatia https://ieeexplore.ieee.org/abstract/document/10888170/</p>
<p>A Generative-Augmented Deep Matrix Factorization Model for POI Recommendations Chongze Lio, Hongl Zhang, Aesta Man, JiaYu Zhang Faculty of Computing, Harbin Institute of Technology, Harbin, China Framework Overview Experimental Results</p> <p>An innovative POI recommendation model combining DMF and generative augmentation. Introduced geographical information modeling (Function Impact & Transfer Cost) into deep learning. Developed novel matrix sampling and update strategies to mitigate data sparsity. Conducted extensive experiments demonstrating superior performance over existing models.</p>	<p>A Generative-Augmented Deep Matrix Factorization Model for POI Recommendations Chongze Lio, Hongl Zhang, Aesta Man, Masa Zhang https://ieeexplore.ieee.org/abstract/document/10890082/</p>
<p>2025 IEEE INTERNATIONAL CONFERENCE ON ACOUSTICS, SPEECH, AND SIGNAL PROCESSING APRIL 10-15, 2025, Hefei (International Conference Center), Hefei, China Abstract In this paper, we introduce a novel Latent Bidirectional Cooperative Diffusion (LBCD) model for image denoising. The proposed model consists of two parallel diffusion processes: a forward process and a backward process. The forward process generates a denoised image via a latent bidirectional cooperative diffusion mechanism, while the backward process generates a noisy image via a latent bidirectional cooperative diffusion mechanism. The proposed model is able to effectively denoise images while maintaining structural details. The experimental results show that the proposed model outperforms state-of-the-art denoising models in terms of both visual quality and quantitative metrics.</p>	<p>2007 IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP) Kun Ma¹², Qilong Han¹, Jingzheng Yao^{2,*}, Changmao Wu¹ and Chunrui NazA¹ https://scholar.archive.org/work/utteultwdberxnhwxuaxknu6be/access/wayback/http://ieeexplore.ieee.org/ielx5/79/34703/01657809.pdf?tp=&arnumber=1657809&isnumber=34703</p>

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Table 2: (Continued)

 <p>This paper introduces UAMA, a novel uncertainty-aware masked modeling framework for medical image segmentation. It addresses the challenge of learning from incomplete and noisy training data by introducing context-aware uncertainty-aware masked patches. The framework consists of three main components: a teacher network, a student network, and a uncertainty-aware masked patch generation module. The teacher network generates uncertainty maps, while the student model generates corresponding masks. The uncertainty-aware masked patch generation module then generates challenging medical image patches for training. The results show improved performance compared to baseline methods.</p>	<p>Masked image modeling advances 3d medical image analysis <i>Der formace and promising scalability in medical MIM. Spect ically, we propose a tel-literative masking stratcoy based on</i> https://openaccess.thecvf.com/content/WACV2023/html/Chen_Masked_Image_Modeling_Advances_3D_Medical_Image_Analysis_WACV_2023_paper.html</p>
 <p>This poster presents a method for protecting the outputs of open-source audio language models. It uses watermarking to detect forged samples and identify the generative model. The process involves adding imperceptible noise to the data, generating a watermark, and then extracting it from the generated samples. The results show that the watermarking method does not significantly impact the performance of the generative model.</p>	<p>Latent watermarking of audio generative models <i>Losses*Inlt..</i> https://ieeexplore.ieee.org/abstract/document/10889782/</p>
 <p>This poster introduces HYMAN, a hybrid memory and attention network for unsupervised anomaly detection. It uses a dual-path architecture with a shared feature space. The first path processes data through a hybrid memory and attention module, while the second path processes it through a traditional neural network. The two paths then merge their features. The results show superior performance compared to baseline methods on various datasets.</p>	<p>HYMAN: Hybrid Memory and Attention Network for Unsupervised Anomaly Detection <i>Jiahao Li, Yiqiang Chen, Yunbing Xing, Yang Gu, Xiangyu Lan</i> https://ieeexplore.ieee.org/abstract/document/10890028/</p>
 <p>This poster presents a frequency enhancement framework for improving image quality and perception accuracy. It introduces frequency enhancement in both architecture and supervision. The results show improved performance on various datasets compared to baseline methods.</p>	<p>A general framework for object detection <i>>As shown in the 29, 3P%, and 4°</i> https://ieeexplore.ieee.org/abstract/document/710772/</p>

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Table 2: (Continued)

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Table 2: (Continued)

This figure is a detailed diagram of a system architecture for named entity speech recognition error correction. It is divided into four main sections: Introduction, System Architecture, Results, and Query Generation.

- Introduction:** Discusses the motivation for the work, mentioning the need for better speech recognition for the visually impaired and the challenges of dealing with errors in ASR systems.
- System Architecture:** Shows a flow from 'ASR Inferences' (e.g., 'John Thompson') through 'Entity Generation' (e.g., 'John Thompson'), 'Query Generation' (e.g., 'John Thompson'), and finally 'Entity Resolution' (e.g., 'John Thompson').
- Results:** Compares 'Retrieval Method' and 'Phonetic ANNs' on datasets like 'WMT14', 'IWSLT14', and 'MSRA'. Phonetic ANNs show better performance across most metrics.
- Query Generation:** Details the process of generating queries from ASR errors. It includes a 'Contact Construction' step where entities are grouped by name and a 'Data' step involving phonetic matching and distance calculations.
- Entity Retrieval:** Describes how entities are retrieved from a database using vector distances and cosine similarity.
- Entity Resolution:** Details the final step where the most likely entity is selected based on context and confidence.

Retrieval augmented correction of named entity speech recognition errors Ernest Pusateri, Anmol Walia, Aniruch Kashi, Bortik Bandyopadhyay, Nadia Hyder, Sayantan Mahinder, Raviteja Anantha, Daben Liu*, and Sashank Gondala**
<https://ieeexplore.ieee.org/abstract/document/10888936>

This figure presents a novel self-prompting strategy for 3D medical image segmentation using the SAM2 model. It is organized into several sections:

- Abstract:** States that SAM2 is a large pre-trained model for 3D medical image segmentation due to its capability to efficiently segment video streams. The proposed method improves segmentation performance by adding self-prompting training to the original SAM2 model.
- Method:**
 - A. LdA adapted Image Encoder:** Describes the design of a Latent Dirichlet Allocation (LdA) adapted image encoder for SAM2. It involves keeping weights frozen to preserve the original structure of the network while allowing the encoder to learn new features through LdA technology. These features are then used to generate prompts for each branch.
 - B. Dynamic Self-prompting Strategy:** Details the dynamic self-prompting strategy. It takes the output of the encoder and fine-tunes it with LdA and transfers them through a multi-layer perceptron (MLP) to generate prompts for each layer.
- Experiment Results:** Shows qualitative results and quantitative metrics comparing the proposed method with baseline models like UNet++ and SAM2.
- Acknowledgment:** Mentions funding from NSFC, NSFC-CEP, and the 3D Biomedical Image Computing Center.

Self-Prompting Driven SAM2 for 3D Medical Image Segmentation a Sorted index from C: s, - (6r,62..., 62...,4)
<https://ieeexplore.ieee.org/abstract/document/10889344>

This figure details a model for Alzheimer's disease detection from spontaneous speech. It includes:

- Abstract:** Outlines the problem of detecting Alzheimer's disease from spontaneous speech and introduces a model that integrates pause information with word embeddings.
- Methods:** Describes the architecture, which consists of a pre-trained language model (BERT) followed by a linear layer for classification. It also discusses the use of pause embeddings and a self-attention mechanism.
- Results:** Compares the proposed model with baseline methods (SVM, RNN, CNN) on the NUS-AD dataset, showing improved performance.
- Acknowledgments:** Mentions funding from NSFC and the 3D Biomedical Image Computing Center.

Integrating Pause Information with Word Embeddings in Language Models for Alzheimer's Disease Detection from Spontaneous Speech Speech Technology lab, Tsinghua University, China
<https://arxiv.org/abs/2501.06727>

This figure presents a novel multi-scale context intertwining framework for panoramic renal pathology segmentation. It includes:

- Abstract:** Describes the challenge of segmenting renal pathology from panoramic images and introduces a multi-scale context intertwining framework.
- Methods:** Details the architecture, which uses a multi-scale feature extraction module and a context intertwining module.
- Experiments:** Compares the proposed model with baseline methods (UNet, U-Net++) on datasets like TUFU-CAN and MSRA.
- Conclusions:** Summarizes the findings and highlights the superior performance of the proposed framework.
- Acknowledgments:** Mentions funding from the National Natural Science Foundation of China and the Chinese Academy of Medical Sciences Innovation Research Project.
- References:** Lists references related to renal pathology segmentation and multi-scale context intertwining.

Multi-scale Context Intertwining for Panoramic Renal Pathology Segmentation Ye Zhang'2, Xlanchao Guan13, Hengrui LI", Xiangming Yan", Ziyue Wang", Yongbing Zhang'
<https://ieeexplore.ieee.org/abstract/document/10889659>

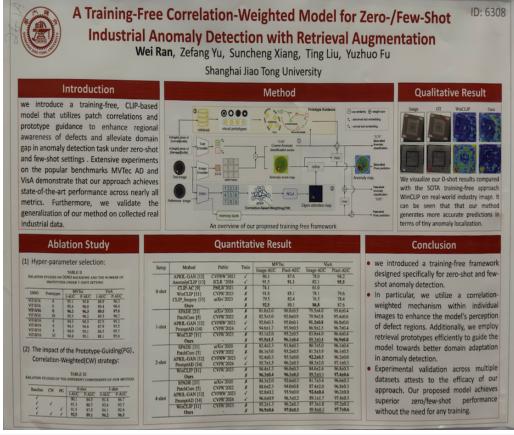
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Table 2: (Continued)

	<p>SELMA: A Speech-Enabled Language Model for Virtual Assistant Interactions <i>Simplified Pigstina, Meduces complarty</i> https://ieeexplore.ieee.org/abstract/document/10890139/</p>
	<p>Glial-neuronal interactions in Alzheimer's disease: the potential role of a 'cytokine cycle' in disease progression <i>hutcmoshini001@Bentuedusg, choc0010@e.ntu.edu.sg, yiha001@e.ntu.edu.sg, congao001@e.ntu.edu.sg, asjagath@ntu.edu.sg</i> https://onlinelibrary.wiley.com/doi/10.1111/j.1750{-}3639.1998.tb00136.x</p>
	<p>Wireless Sensor Networks: 13th China Conference, CWSN 2019, Chongqing, China, October 12–14, 2019, Revised Selected Papers 1. <i>College of Computer Science and Technology, Chongqing University of Posts and Telecommunications, Chongqing, China</i> https://books.google.com/books?hl=en&lr=&id=o3fADwAAQBAJ&oi=fnd&pg=PR6&dq=1.+College+of+Computer+Science+and+Technology,+Chongqing+University+of+Posts+and+Telecommunications,+Chongqing.+China&ots=xK3vgQuzGb&sig=1R1Jj8oR{-}X4PqqWdWiKUW8crgKE</p>
	<p>AI-Generated Music Detection and its Challenges <i>Suno, Udio, Riffusion, ...</i> https://arxiv.org/abs/2501.10111</p>

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Table 2: (Continued)

 <p>A Training-Free Correlation-Weighted Model for Zero-/Few-Shot Industrial Anomaly Detection with Retrieval Augmentation Wei Ran, Zefang Yu, Suncheng Xiang, Ting Liu, Yuzhuo Fu Shanghai Jiao Tong University</p> <p>Introduction we introduce a training-free, CLP-based model that utilizes prior knowledge and prototype guidance to enhance regional awareness of defects and alleviate domain gap in anomaly detection task under zero-shot or few-shot settings. Extensive experiments on three benchmarks (MoCap, MoAn and Vis4) demonstrate that our approach achieves state-of-the-art performance across nearly all metrics. Furthermore, we validate the generalization of our method on collected real industrial data.</p> <p>Method The proposed framework consists of three main components: 1. Prototype Guiding: A pre-trained CLP model is used to generate prototypes for each category. 2. Region-aware learning: The model uses a correlation-weighted mechanism to emphasize regions of interest. 3. Retrieval Augmentation: The model retrieves prototypes from a database to guide the model towards better domain adaptation in anomaly detection.</p> <p>Qualitative Result We visualize our 0-shot results compared with the SOTA training-free approach. The qualitative results show that our method can be seen that our method generates more accurate predictions in terms of key anomaly locations.</p>	<p>A Training-Free Correlation-Weighted Model for Zero-/Few-Shot Industrial Anomaly Detection with Retrieval Augmentation Wei Ran, Zefang Yu, Suncheng Xiang, Ting Liu, Yuzhuo Fu https://ieeexplore.ieee.org/abstract/document/10890083/</p>
 <p>Parameter-efficient fine-tuning of large-scale pre-trained language models Changzeng Fits, Zelin Fut, Shaojun Yant, Xiaoyong Lyvt, Yuliang Zhaot</p> <p>INTRODUCTION Fine-tuning of Language Models in Traditional Clinical Medicine Disease Diagnosis</p> <p>Dataset HACI</p> <p>EXPERIMENTAL SETUP 1. Data Collection 2. Feature Extraction 3. Model Training 4. Evaluation</p> <p>EXPERIMENTAL RESULTS Comprehensive Results</p> <p>Conclusion Proposed framework can significantly improve the performance of pre-trained language models for clinical medicine disease diagnosis tasks.</p>	<p>Parameter-efficient fine-tuning of large-scale pre-trained language models Changzeng Fits, Zelin Fut, Shaojun Yant, Xiaoyong Lyvt, Yuliang Zhaot</p> <p>https://www.nature.com/articles/s42256{-}023{-}00626{-}4</p>