Chenyu Gao

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Education

University of York, UK *2022.10 - Exp. 2026.9*

PhD in Music

- Supervisors: Dr. Federico Reuben, and Dr. Tom Collins.
- Thesis: Symbolic music generation for diversification of video game music assets through automatic variation and arrangement

Northwestern Polytechnical University, China *09.2019 - 03.2022*

MSc in Software Engineering *GPA:91.28/100*

- Thesis: Research on Vision-and-Language Methods for Images with Scene Text

Northwestern Polytechnical University, China *09.2015 - 06.2019*

BS in Software Engineering *GPA:85.27/100*

- Thesis: Lightweight target counting neural network model

Projects

Symbolic music generation for diversification of video game music assets through automatic variation and arrangement *2022-Now*

- Designed novel music variation generation approaches and an automatic theme-and-variation pair annotation method, leading to a first-author publication at a top-tier conference (ISMIR 2024).
- Proposed VG-Arranger, an automatic arranging approach tailored for game music, which operates using cross-attention-based feature fusion techniques and follows a self-supervised training scheme. VG-Arranger supports multi-instrument arrangement generation whilst enabling the addition of percussion instruments.

Interpretability studies of deep learning models *2020-Now*

- Conducted a comprehensive investigation into how changes in data representation and datasets influence the roles and importance of different attention heads in the Music Transformer, leading to a first-author paper currently under 2nd-round review at a top-tier journal (TISMIR).
- Investigated the roles of individual heads and layers in Transformer models for different types of Visual Question Answering (VQA) tasks, and proposed a dynamic chopping module that adaptively removes redundant heads and layers in VisualBERT at the instance level, resulting in a first-author publication at a top-tier conference (IJCAI 2021).

Computational music analysis *2022-Now*

- Collaborated with Integrated Researcher Mafalda Nejmeddine (CESEM/IN2PAST, University of Évora), developing algorithms for intra- and inter-opus musical pattern discovery, enabling the computational differentiation of Italian and Portuguese keyboard music (1750–1807).
- Proposed an algorithm for converting linear repetitive annotations to hierarchical annotations, and introduced a web-based interface where hierarchical annotations of 909 songs can be explored and played back, resulting in a first-author conference publication (HCII 2023).

Multimodal machine learning *2020-2022*

- Proposed a Structured Multimodal Attentional (SMA) model for the TextVQA task, leveraging text-object graph reasoning and generative answer prediction, leading to a first-author publication at a top-tier journal (TPAMI).
- Mentored undergraduate research, resulting in a published AAAI paper proposing a strong baseline for text-based vision-and-language tasks with an efficient feature fusion method.

Publication

Gao, C., PARIS, F. R., & Collins, T. (2024). Variation Transformer: New datasets, models, and comparative evaluation for symbolic music variation generation. In *25th International Society for Music Information Retrieval (ISMIR)*.

Gao, C., & Collins, T. An interpretability study of Music Transformer on video game music and pop music. Under the 2nd round review at *Transactions of the International Society for Music Information Retrieval (TISMIR)*.

Gao, C., PARIS, F. R., & Collins, T. MelEx: A new dataset, algorithm, and comparative evaluation for melody extraction in symbolic music. Under the 2nd round review at *the Journal of New Music Research (JNMR)*.

Gao, C., & Collins, T. (2023). The Pendular Graph: Visualising Hierarchical Repetitive Structure in Point-Set Representations of the POP909 Music Dataset. In *International Conference on Human-Computer Interaction (HCII)*.

Gao, C., Zhu, Q., Wang, P., Li, H., Liu, Y., Van den Hengel, A., & Wu, Q. (2022). Structured multimodal attentions for textvqa. *IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)*.

Gao, C., Zhu, Q., Wang, P., & Wu, Q. (2021). Chop chop BERT: visual question answering by chopping VisualBERT's heads. In *30th International Joint Conference on Artificial Intelligence (IJCAI)*.

Zhu, Q., **Gao, C.**, Wang, P., & Wu, Q. (2021). Simple is not easy: A simple strong baseline for TextVQA and TextCaps. In *Proceedings of the AAAI conference on artificial intelligence (AAAI)*.

Wang, P., **Gao, C.**, Wang, Y., Li, H., & Gao, Y. (2020). MobileCount: An efficient encoder-decoder framework for real-time crowd counting. *Neurocomputing*.

Honors & Awards

Doctoral Fellowships	2025
York Open Research Awards	2025
Master of Engineering with Honors	2022
National Scholarship for Graduate Students	2020
1ST Place, the CVPR 2020 TextVQA Challenge	2020
Bronze Medal, The ACM-ICPC Asia Regional Contest Urumqi Site	2017
Bronze Medal, The ACM-ICPC China Invitational Contest	2017
Bronze Medal, The ACM-ICPC Asia Regional Contest Qingdao Site	2016

Skills

Programming Python, JAVA, JavaScript, C++, LaTeX
Framework PyTorch, Tensorflow
Languages Mandarin (Native), English (IELTS 7.0)

Academic Activities

Guest lecturer
Advanced AI Techniques for Creative Practice (a master level module) *2025*

Conference Reviewers
International Society for Music Information Retrieval Conference (ISMIR) *2022 - 2025*

Journal Reviewers
Journal of New Music Research, Music & Science, Journal of Creative Music Systems -

Volunteers
Assistant to the Paper Chairs for the International Conference on AI and Musical Creativity *2024*