

Computer-Assisted Composition Tutorial: From Survey to Studio Workflows with MIDI-GPT (Half-day, AIMC 2026)

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Abstract

This tutorial introduces Computer-Assisted Composition (CAC) through a progression from critical survey to studio practice. Drawing on a recently published typology of 125 CAC systems spanning over 60 years, the session situates contemporary AI music tools within broader compositional, technical, and interaction paradigms. Participants engage with curated systems examples, followed by live demonstrations of co-creative workflows using Calliope and Reaper. The tutorial culminates in a guided hands-on session where attendees experiment with generative MIDI workflows, iterative generation, infilling, and arrangement. In contrast to dominant prompt-based approaches, the session emphasizes iterative, DAW-integrated practices that preserve user agency, authorship, and compositional control. The tutorial bridges research and practice, equipping participants with conceptual frameworks and practical techniques for integrating AI into music production workflows.

1 TUTORIAL PROPOSAL

Computer-Assisted Composition (CAC) is a long-standing field concerned with the use of computational systems to support musical composition. A recent survey of 125 systems (1963–2025) highlights both the historical continuity and rapid evolution of CAC. Early systems relied on rule-based and stochastic processes, while contemporary approaches increasingly employ machine learning, particularly deep and transformer-based architectures.

This work also emphasizes that CAC systems should be understood not only in terms of their generative capabilities but through their **interaction paradigms**, including one-shot generation, iterative refinement, and co-creative dialogue. CAC is therefore distinct from autonomous music generation in that it explicitly centers the role of the human composer.

Despite this, current AI music tools, especially text-to-music systems, often privilege prompt-based, one-shot interaction. While accessible, these approaches can reduce compositional agency and limit iterative exploration. This raises concerns regarding control, expressivity, and interaction design.

This tutorial responds by focusing on **studio-integrated, iterative workflows**, positioning AI as a compositional

operator embedded within Digital Audio Workstations (DAWs), rather than a black-box generator.

2 TUTORIAL STRUCTURE

The tutorial follows a three-stage structure: survey, deeper presentation of selected systems, and hands-on practice with MIDI-GPT in Reaper.

The tutorial plan is a such (with discussion and interaction time built in), for a total length of 3h (can be adapted on demand):

- Introduction and motivation (10 minutes)
- Overview of the CAC typology (20 minutes): see the paper for details.
- Demonstration and deepening of selected systems (50 minutes): contrasting interaction models, and aesthetic implications of system design.
- Coffee Break (15mins)
- Transformer-based models for symbolic music generation, and MIDI-GPT (20min): introduction to the GigaMIDI dataset, MIDI-GPT model family, and technical description.
- Interactive Demonstration in Reaper (15min): will demo the various functionality of the system and go through common use cases.
- Hand-on generation and discussion (40mins): participants will be able to try it for themselves (using a web-based version in Calliope to cut installation time). Participants will listen to each other's generated snippets and discuss

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affordances, excitations, frustrations, and other reactions.

- Conclusion (10 minutes)

Overall, demonstrations, interactions, listening, and hands-on will constitute the vast majority of the time.

3 TECH RIDER

Contributor

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Philippe Pasquier is a scientist-artist working at the intersection of generative systems, computational creativity, and human-AI co-creation. He is a Professor at Simon Fraser University where he directs the Metacreation Lab for Creative AI. His research-creation practice spans music, moving image, and interactive media, with a focus on designing co-creative AI systems that augment human creativity. He has authored over 200 peer-reviewed publications and his artwork has been presented internationally at venues such as Ars Electronica, IRCAM, and Mutek. He collaborates with both academia and industry to develop tools for real-world creative workflows, including DAW-integrated generative systems. This includes collaboration on computer-assisted composition system developed with Steinberg, Teenage Engineering, and Audiokinetic, as well as open-source projects.

Equipment Provided

- Presenter laptop with Calliope and Reaper installed
- Pre-configured demo sessions and project files
- Curated audio and video examples for listening session and system exploration.
- Sample MIDI files and templates for hands-on exercises

Equipment Required

- Room with reliable internet connection (the hands-on relies on internet access)
- Projector and screen for demonstrations
- Stereo audio system (essential for music playback)
- Power outlets accessible to participants

No specialized hardware (e.g., MIDI controllers) is required.

Proposed Duration

- 3 hours (but can be shorten to 2 or lengthen to 4 on demand).

ACKNOWLEDGMENTS

The authors acknowledge the support of the Social Sciences and Humanities Research Council of Canada (SSHRC) and the Natural Sciences and Engineering Research Council of Canada (NSERC), whose funding has contributed to the development of this research and tutorial.

AUTHOR DECLARATIONS

MS Word grammatical tool was used to help with syntax.

REFERENCES

While many references will be made in the tutorial (including a number of those appearing in the survey), I keep it simple and on point here.

Pasquier, P., & Tchameube, R. B. (2026). *Survey and typology of computer-assisted composition systems*. *ACM Computing Surveys*. Advance online publication. <https://doi.org/10.1145/3812539>