

PAT 463/563 (Fall 2026)

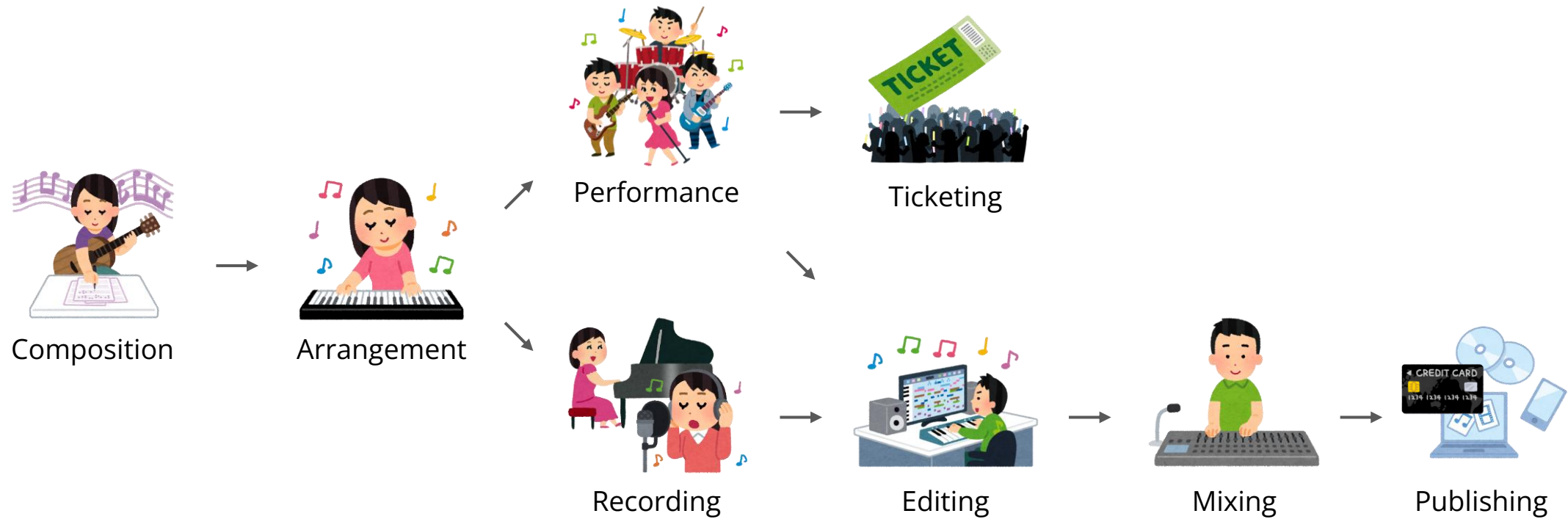
Music & AI

Lecture 3: AI & Music

Instructor: Hao-Wen (Herman) Dong

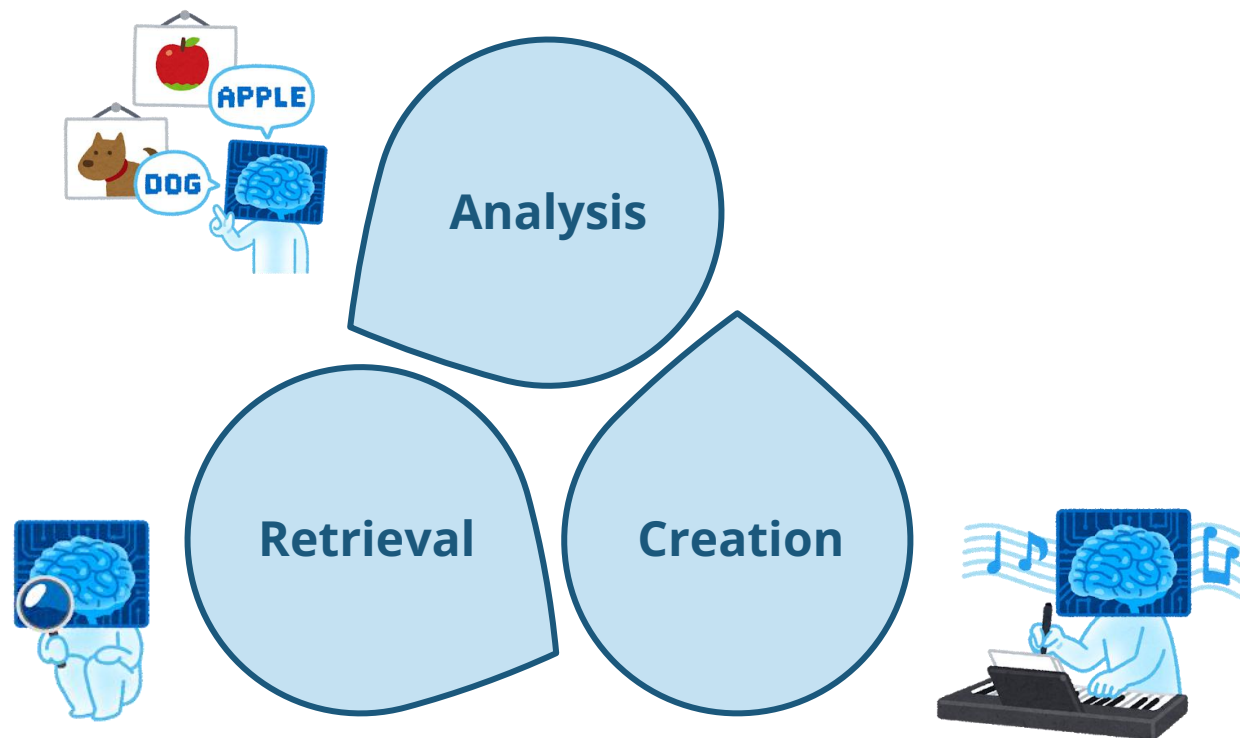
Music & AI

An Overly-Simplified Music Production Workflow



Music Information Research (MIR)

- “Intelligent ways to analyze, retrieve and create music” (Yang 2018)



Use Cases of AI for Music & Audio



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[uploadvr.com/iron-man-vr-breaks-free-from-cords-load-screens-on-quest-2/](#)
[descript.com/blog/article/what-is-the-best-audio-interface-for-recording-a-podcast](#)
[denverpost.com/2019/08/02/colorado-symphony-movie-scores-harry-potter-star-wars/](#)
[dailybruin.com/2023/08/04/theater-review-the-musical-les-misrables-offers-stellar-displays-and-impassioned-vocals](#)

Music & Technology Co-evolves



Hildegard Dodel, Public domain, via Wikimedia Commons.
Taken at Hamamatsu Museum of Musical Instruments, August 2019.
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Music & AI Co-evolves

(Source: Yamaha)



(Source: Sankei Shimbun)



(Source: Robot Gizmos)



(Source: clairechoquette.com)

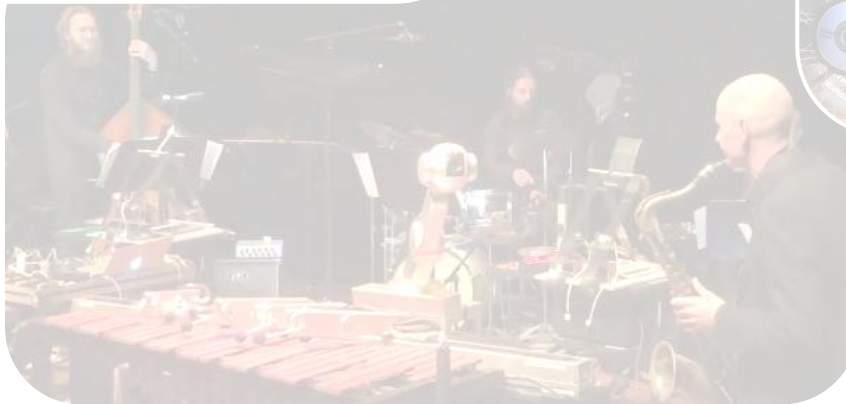
yamaha.com/en/news_release/2018/18013101/
sankei.com/article/20240113-CQCOSQHJWFIYPJJKZDCITRTRV/
roboticgizmos.com/shimon-musical-robot-deep-learning/
clairechoquette.com/portfolio/dust-bowl

Music & AI Co-evolves

(Source: Yamaha)



(Source: Sankei Shimbun)



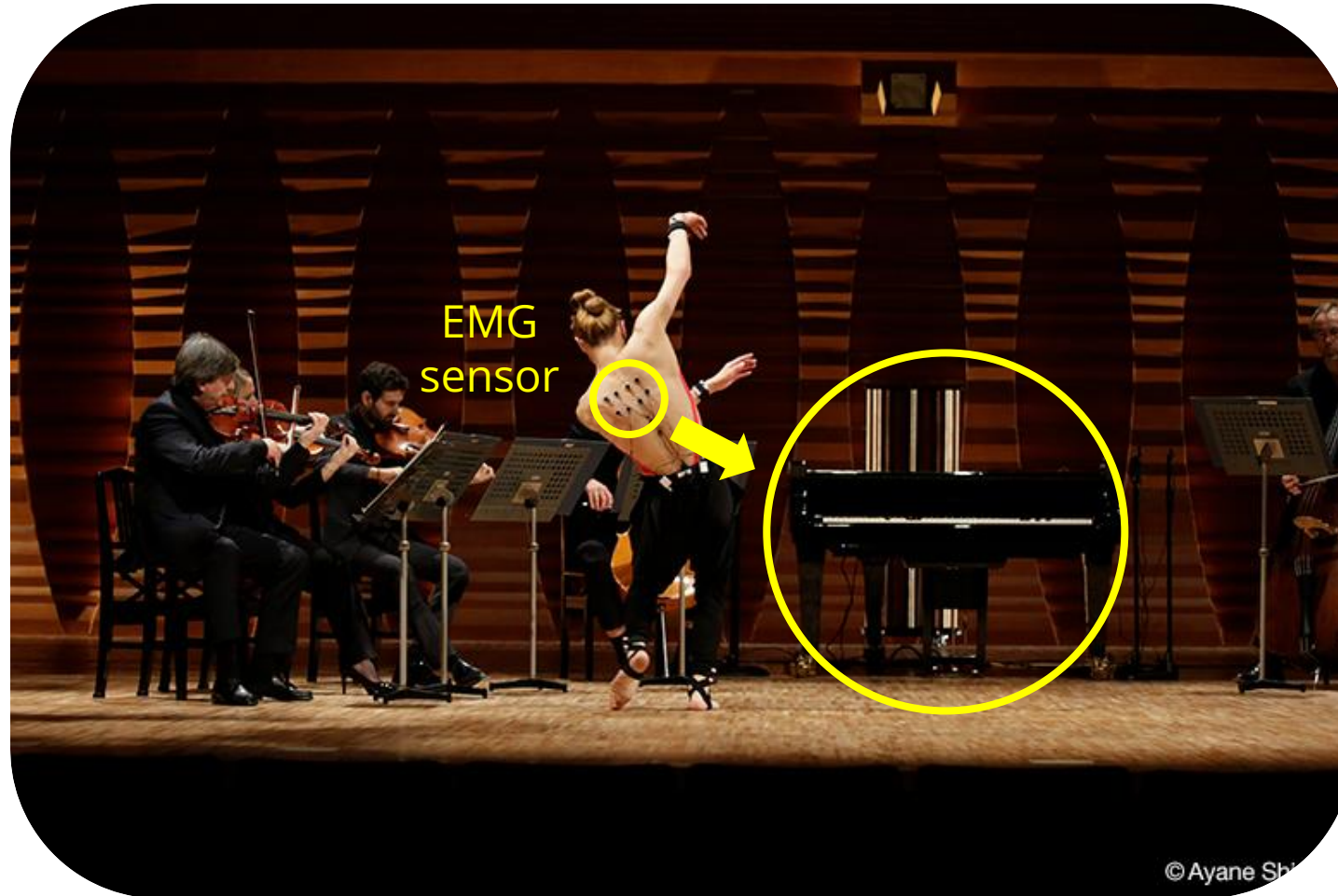
(Source: Robot Gizmos)



(Source: clairechoquette.com)

yamaha.com/en/news_release/2018/18013101/
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clairechoquette.com/portfolio/dust-bowl/

AI Transforms a **Dancer** into a Pianist (2018)



(Source: Yamaha)

| AI Transforms a **Dancer** into a Pianist (2018)

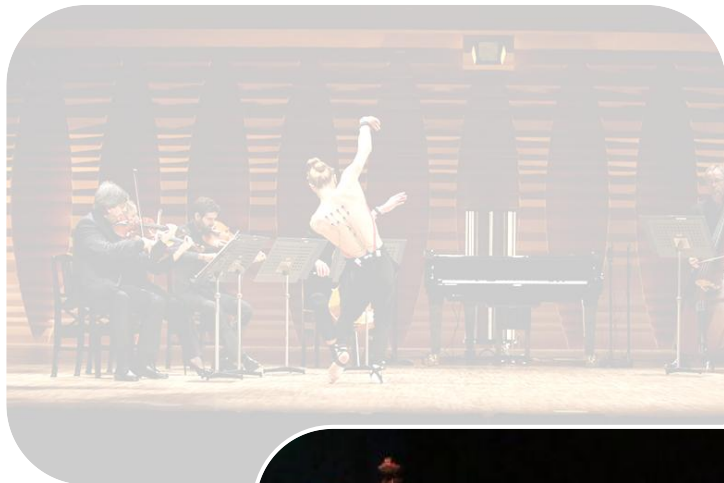


youtu.be/21injmy1wsU



Music & AI Co-evolves

(Source: Yamaha)



(Source: Sankei Shimbun)



(Source: Robot Gizmos)



(Source: clairechoquette.com)

yamaha.com/en/news_release/2018/18013101/
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roboticgizmos.com/shimon-musical-robot-deep-learning/
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Shimon with the Aarhus Jazz Orchestra (2021)



(Source: Robot Gizmos)

| Shimon with the Aarhus Jazz Orchestra (2021)

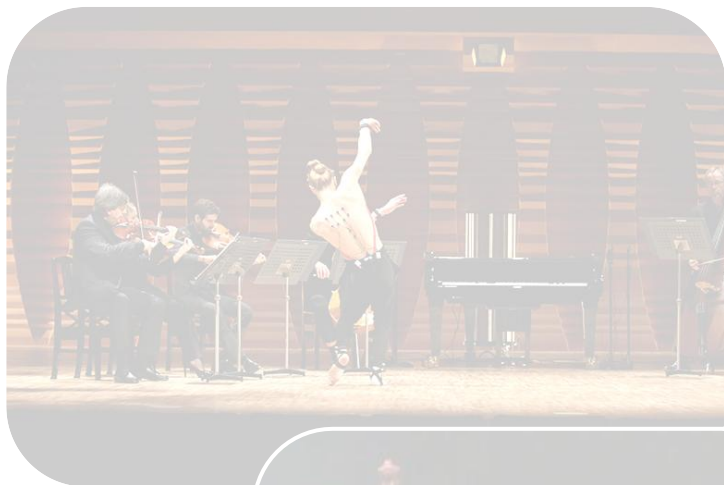


youtu.be/ZpTV1-acSU8

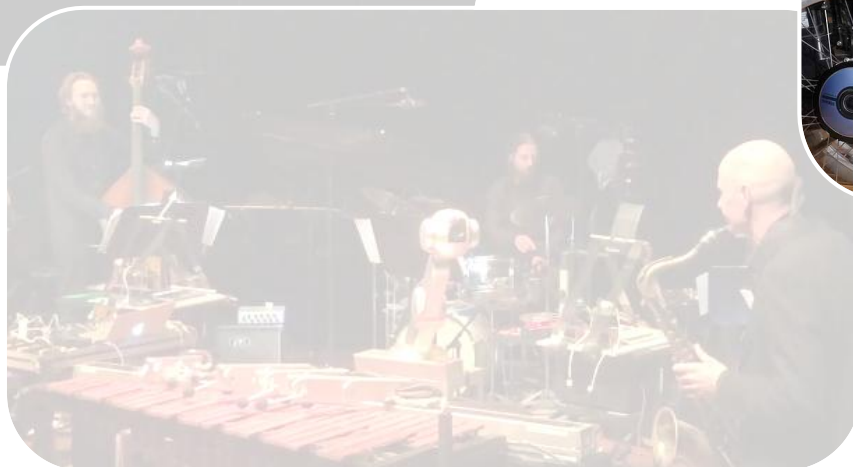


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(Source: Yamaha)



(Source: Sankei Shimbun)



(Source: Robot Gizmos)

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roboticgizmos.com/shimon-musical-robot-deep-learning/
clairechoquette.com/portfolio/dust-bowl/



(Source: clairechoquette.com)

| The Ninth for Everyone (だれでも第九) (2023)



(Source: Sankei Shimbun)

sankei.com/article/20240113-CQCOSQHJWEIYPJJKZDCITRTRVI/
yamaha.com/en/stories/culture/the-9th/

だれでも
第九

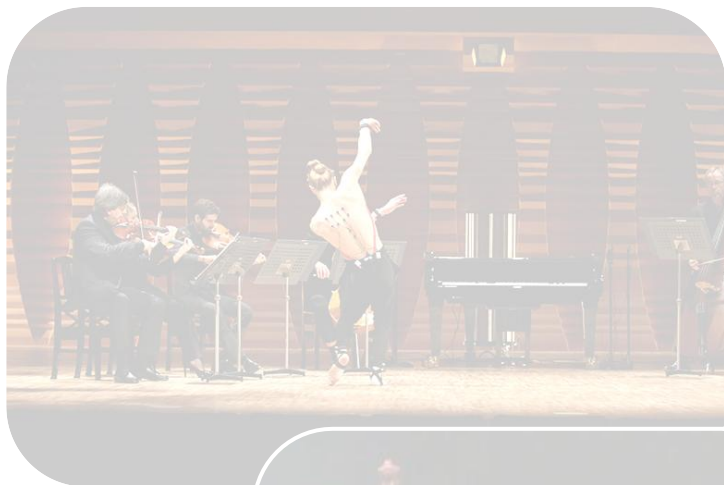


第4楽章

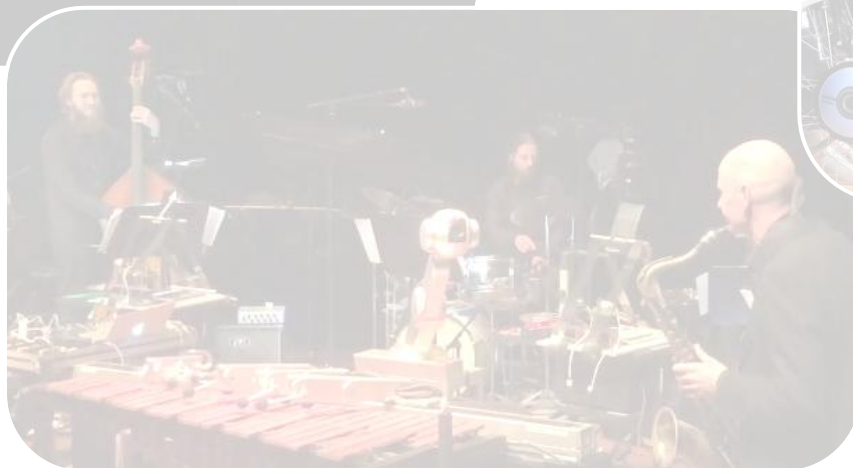


Music & AI Co-evolves

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(Source: Sankei Shimbun)



(Source: Robot Gizmos)

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roboticgizmos.com/shimon-musical-robot-deep-learning/
clairechoquette.com/portfolio/dust-bowl/



(Source: clairechoquette.com)

Dust Bowl by Verdigris Ensemble (2024)



(Source: clairechoquette.com)

clairechoquette.com/portfolio/dust-bowl
facebook.com/watch/?v=284978893494618

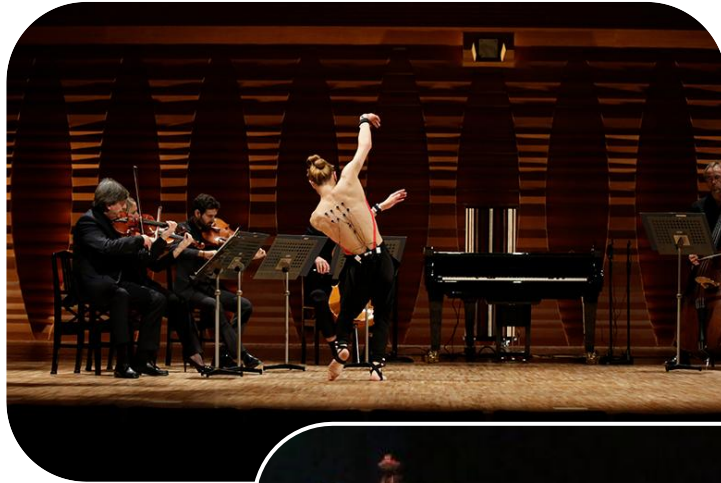
Bringing Historical Images to Life using AI



youtu.be/_E5Sf3O4-MY

Music & AI Co-evolves

(Source: Yamaha)



(Source: Sankei Shimbun)



(Source: Robot Gizmos)



(Source: clairechoquette.com)

yamaha.com/en/news_release/2018/18013101/
sankei.com/article/20240113-CQCOSQHJWFIYPJJKZDCITRTRVI/
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clairechoquette.com/portfolio/dust-bowl

AI for Music in the Early Days

| The Early Days

Musical Dice Game (1792)



(Source: gbrachetta)

gbrachetta.github.io/Musical-Dice/

ILLIAC Suite (1957)



(Source: Illinois Distributed Museum)

Emily Howell (2003)



(Source: The Guardian)

gbrachetta.github.io/Musical-Dice/
distributedmuseum.illinois.edu/exhibit/illiac-suite/
theguardian.com/technology/2010/jul/11/david-cope-computer-composer

Musical Dice Game (attributed to Mozart, 1792)

Table des Chiffres pour le Walzer.
Zahlentafel für den Walzer.

Première Partie.
Erster Theil.

	A	B	C	D	E	F	G	H
2	96	22	141	41	105	122	11	30
3	32	6	128	63	146	46	134	81
4	69	95	158	13	153	55	110	24
5	40	17	113	85	161	2	159	100
6	148	74	163	45	80	97	36	107
7	04	157	27	167	154	68	118	91
8	52	60	171	53	99	133	21	127
9	19	84	114	50	140	86	169	94
10	98	142	42	156	75	129	62	123
11	2	87	165	61	135	47	147	33
12	10	03	28	37	106	5		

Seconde Partie.
Zweiter Theil.

	A	B	C	D	E	F	G	H
2	70	121	26	9	112	49	109	14
3	117	39	126	56	174	18	116	83
4	66	139	15	132	73	58	145	79
5	90	176	7	34	67	160	52	170
6	25	143	64	125	76	136	1	93
7	138	71	150	29	101	162	23	151
8	16	155	57	175	43	168	89	172
9	120	88	48	166	51	115	72	111
10	65	77	19	82	137	38	149	8
11	102	4	31	164	144	59	173	78
12	35	20	108	92	12	124	44	131



(Source: gbrachetta)

gbrachetta.github.io/Musical-Dice/

Lejaren Hiller: **ILLIAC Suite** for String Quartet (1957)

ILLIAC SUITE FOR STRING QUARTET

3

I. EXPERIMENT NO. 1

L.A. HILLER, JR. AND L.M. ISAACSON

PRESTO

VIOLIN I

VIOLIN II

VIOLA

CELLO

(A)



(Source: Illinois Distributed Museum)

youtu.be/n0njBFLQSk8 &
music.arts.uci.edu/abauer/3.1/scores/Hiller_Illiac_Suite.pdf



ILLIAC & ILLIAC Suite @ UIUC!



| Emily Howell (by David Cope) – Prelude (2007)



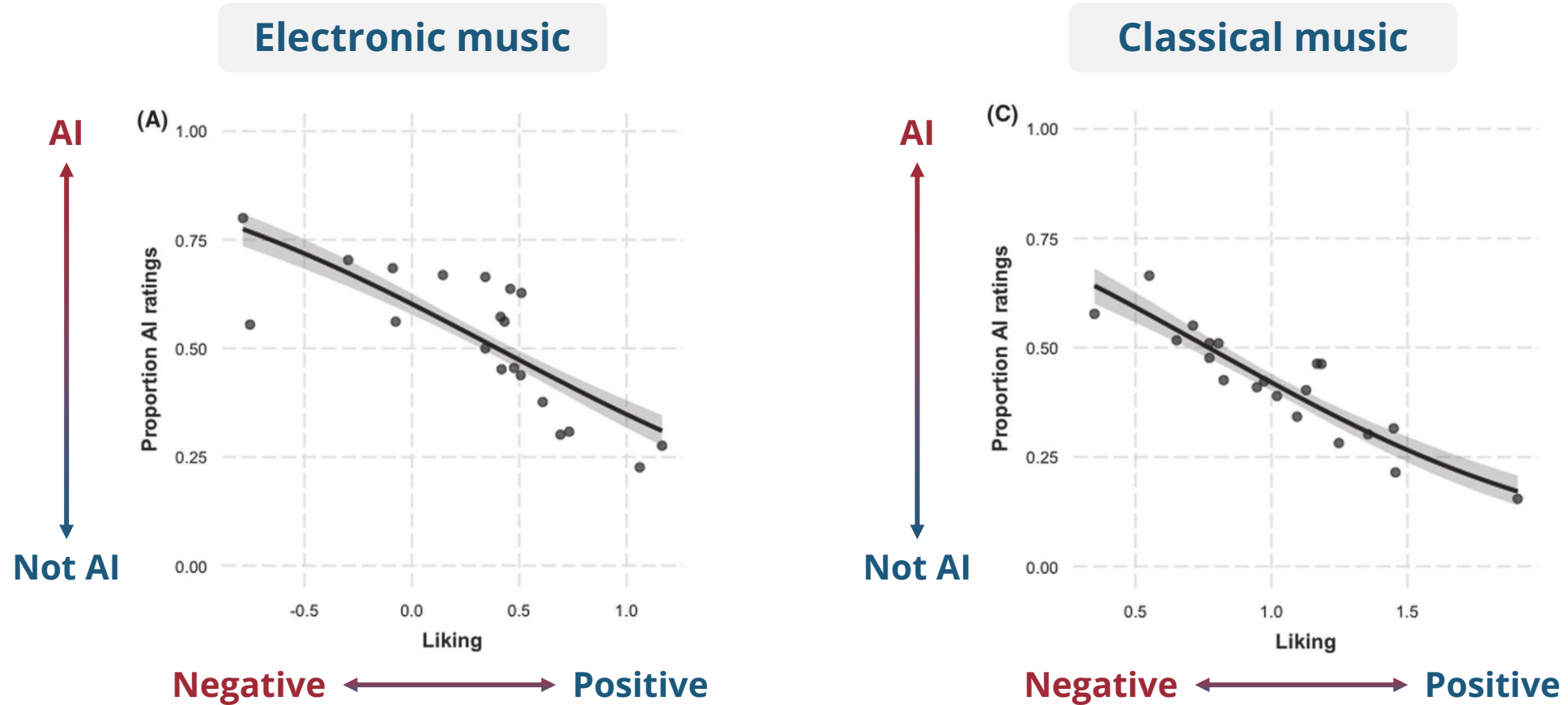
youtu.be/QHJqp4SIsou

Reading: David Cope on Emily Howell

- David Cope: 'You pushed the button and out came hundreds and thousands of sonatas'
 - Interview by Tim Adams published on *The Observer*, *The Guardians*, July 10, 2010

"People tell me they don't hear soul in the music," he says. "When they do that, I pull out a page of notes and ask them to show me where the soul is. We like to think that what we hear is soul, but I think audience members put themselves down a lot in that respect. **The feelings that we get from listening to music are something we produce, it's not there in the notes. It comes from emotional insight in each of us, the music is just the trigger.**"

AI Composer Bias (Shank et al., 2023)



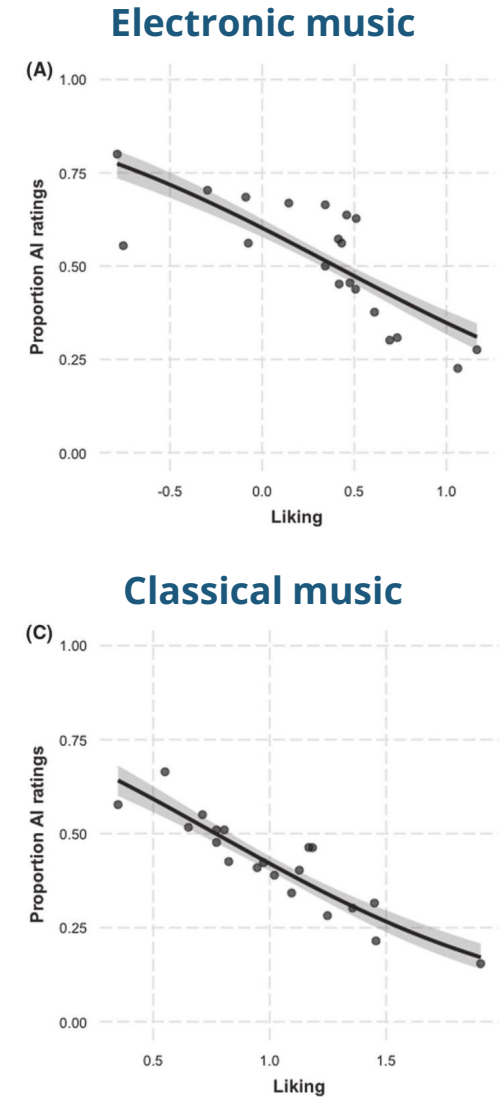
(Source: Shank et al., 2023)

How should we interpret these results?

Daniel B. Shank, Courtney Stefanik, Cassidy Stuhlsatz, Kaelyn Kacirek, and Amy M. Belfi, "AI composer bias: Listeners like music less when they think it was composed by an AI," *Journal of Experimental Psychology: Applied*, 29(3):676-692, 2023.

🤔 AI Composer Bias (Shank et al., 2023)

- How should we interpret these results?
- Three hypotheses:
 1. People think that the music is generated by AI, so they don't like it
 2. People don't like the music, so they think the song is likely generated by AI
 3. There is no causality
- How can we test these hypotheses?
- **Correlation does not imply causation!**



(Source: Shank et al., 2023)

Daniel B. Shank, Courtney Stefanik, Cassidy Stuhlsatz, Kaelyn Kacirek, and Amy M. Belfi, "AI composer bias: Listeners like music less when they think it was composed by an AI," *Journal of Experimental Psychology: Applied*, 29(3):676-692, 2023.

Moises

Moises

- 🎉 **Free Moises Premium license** until **December 2026**
- Register [here](#)
 - Use your **U-M email** (@umich.edu)
 - Sign up in your **desktop browser**
 - Ignore the prompt to upgrade your account



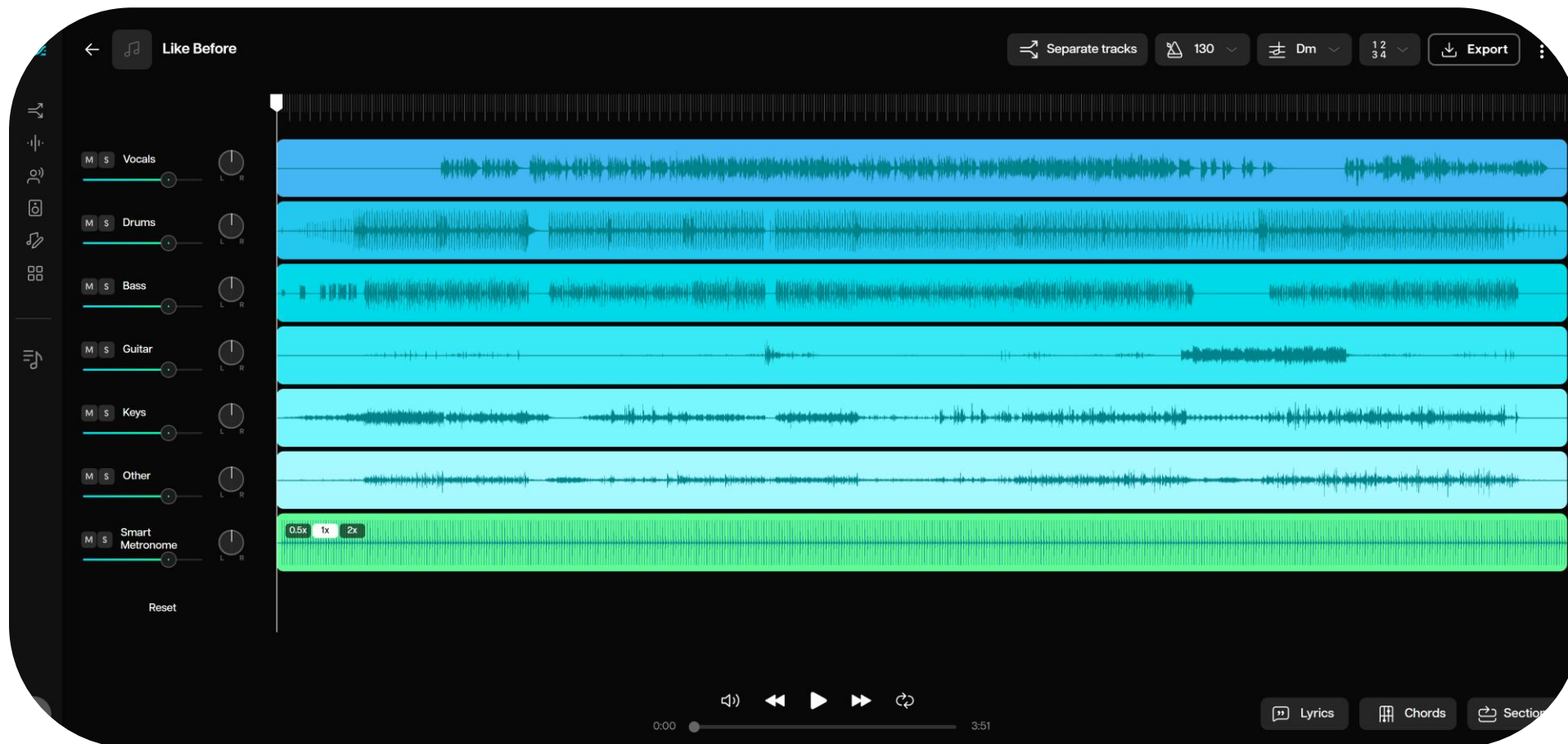
Moises Features

- Stem separation
- Smart metronome & Speed changer
- Pitch changer
- Key & chord detection
- Song section detector
- Lyric transcription
- Voice studio
- AI mastering
- *and more...*

Moises Premium vs. Pro

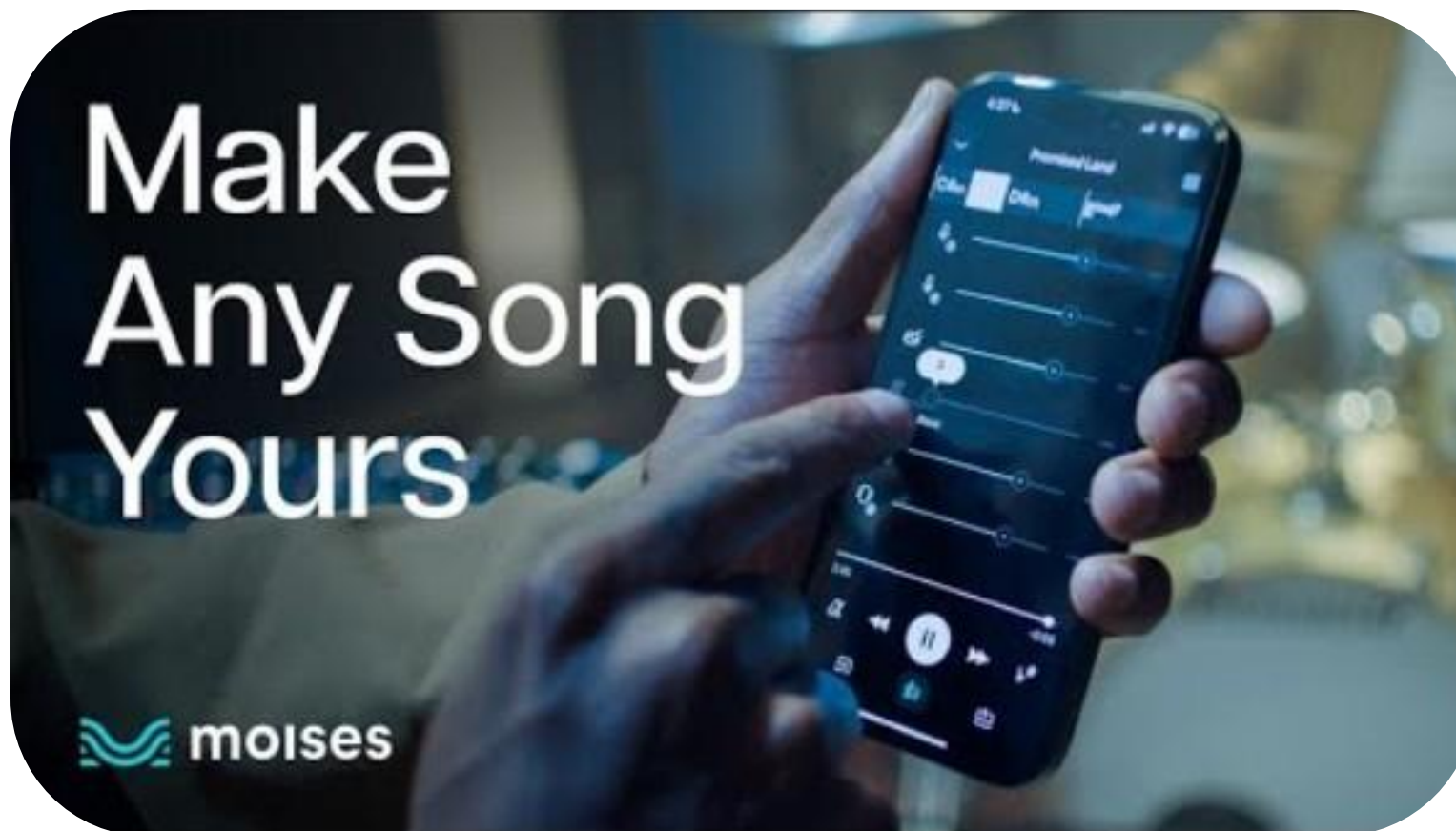
Free	Premium	Current plan PRO
Limited core features - for free	Full access for the serious musician	Advanced AI tools for creators
\$0	\$5.99 Per month	\$29.99 Per month
Free includes:	Everything in Free, plus:	Everything in Premium, plus:
Stem separation	Stem separation	Stem separation
✓ 5 AI audio separations per month ✓ Free pitch & tempo changer	✓ Unlimited audio separations ✓ Isolate more instruments & vocals ✓ 20 min length separation	✓ Hi-Fi AI separation models ✓ Drum parts & multimedia tracks ✓ Custom multi-track separation
AI Stem generation	AI Stem generation	AI Stem generation
✓ 10 monthly Gen-AI credits ✓ 1 minute limit on exports	✓ 200 monthly Gen-AI credits ✓ No time limit on exports	✓ Unlimited credits ✓ Advanced creative control ✓ 10 simultaneous generations ✓ AI mixing
Other benefits	And more:	And more:
✓ Key and BPM detection	✓ Advanced AI Chords ✓ Unlimited AI metronome ✓ Reference Mastering	✓ Lossless exports (WAV & more) ✓ Voice Studio ✓ Advanced AI mastering ✓ VST Plugins

Moises Demo



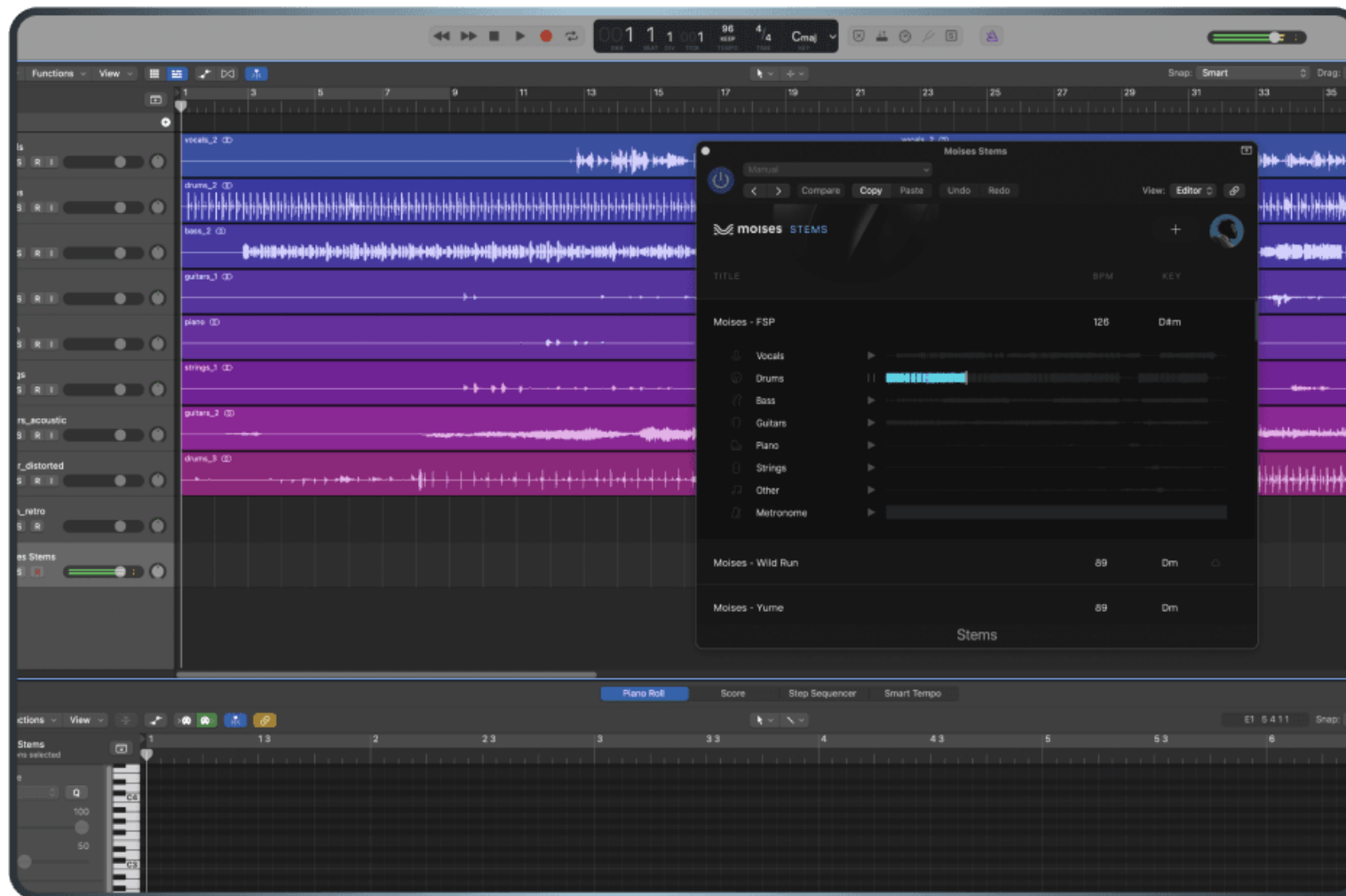
(Source: Moises)

Moises App Demo



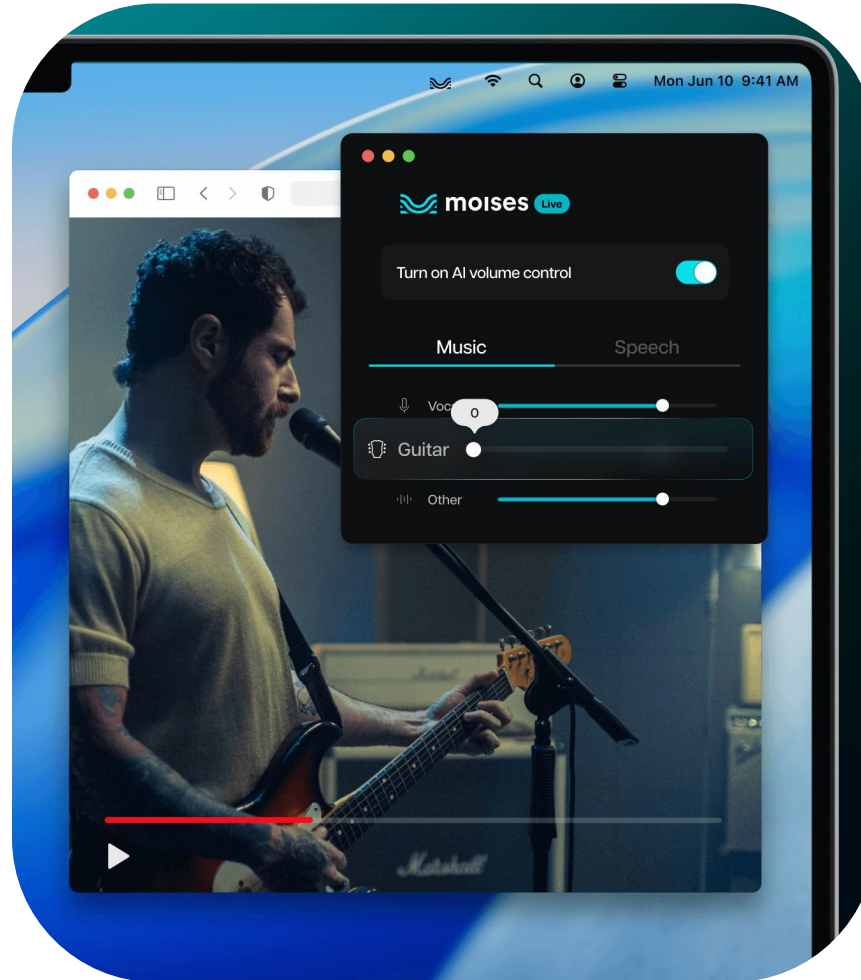
youtu.be/Pyfx95X8d1Q

Moises VST Plugin



(Source: Moises)

Moises Live



(Source: Moises)

Resources on Moises

- Part 1: “This is the way that a lot of tracks start”
- Part 2: Creating backing vocals from scratch
- Part 3: A new way to mix drums

Recap

Use Cases of AI for Music & Audio



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[descript.com/blog/article/what-is-the-best-audio-interface-for-recording-a-podcast](#)
[denverpost.com/2019/08/02/colorado-symphony-movie-scores-harry-potter-star-wars/](#)
[dailybruin.com/2023/08/04/theater-review-the-musical-les-misrables-offers-stellar-displays-and-impassioned-vocals](#)

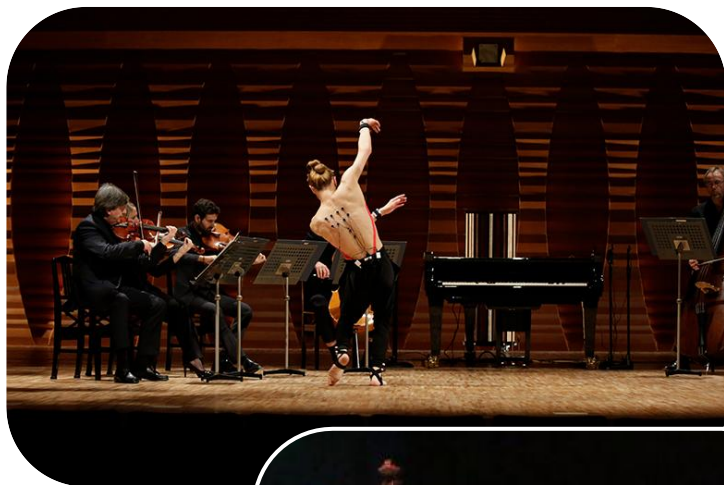
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Hildegard Dodel, Public domain, via Wikimedia Commons.
Taken at Hamamatsu Museum of Musical Instruments, August 2019.
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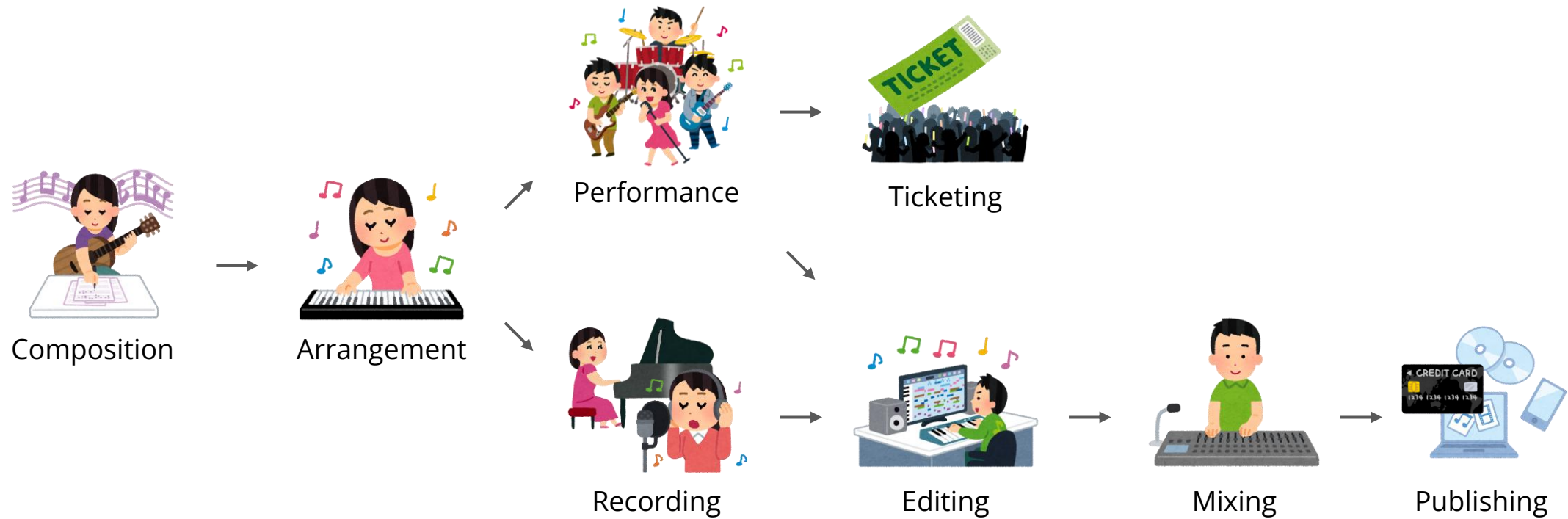
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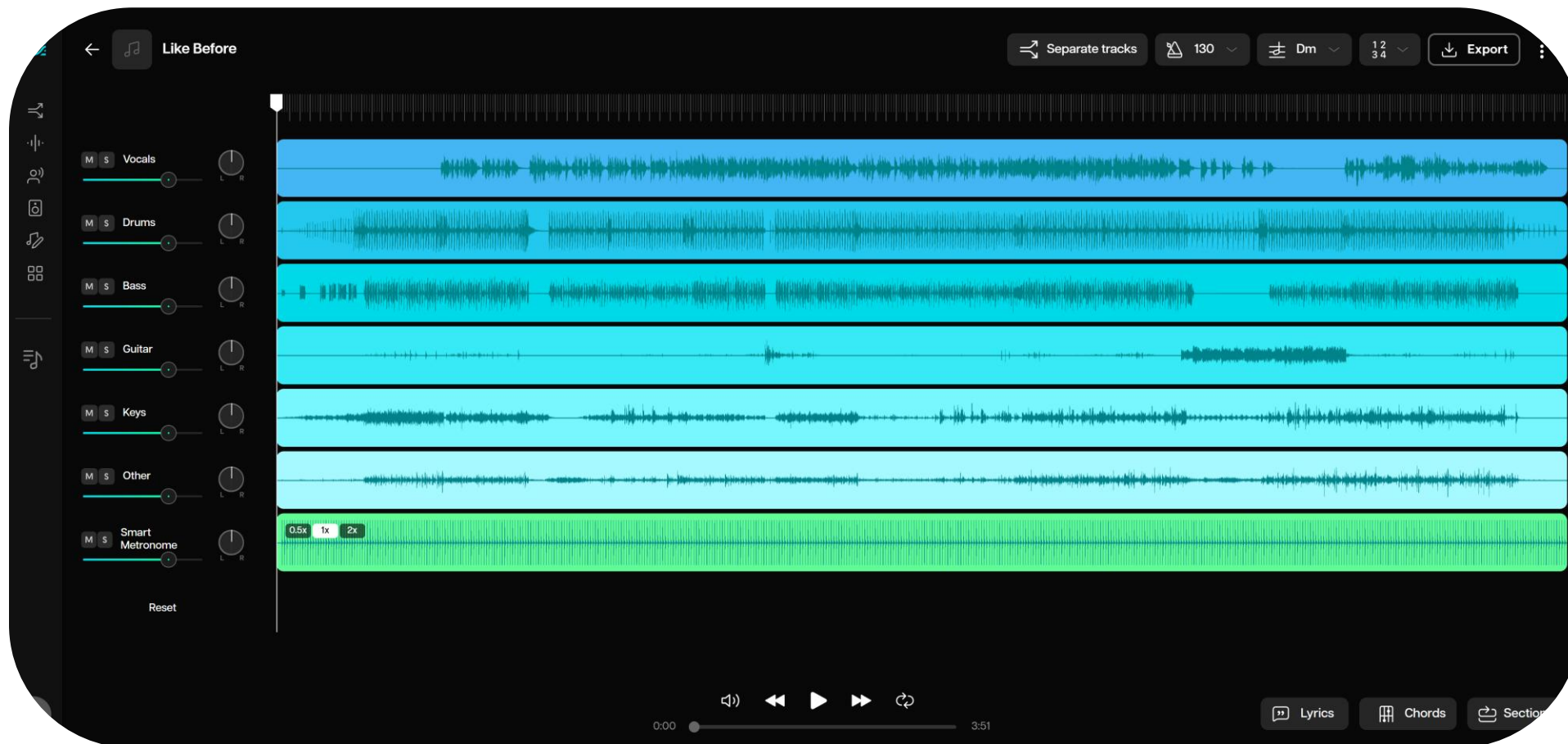
(Source: The Guardian)

gbrachetta.github.io/Musical-Dice/
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An Overly-Simplified Music Production Workflow



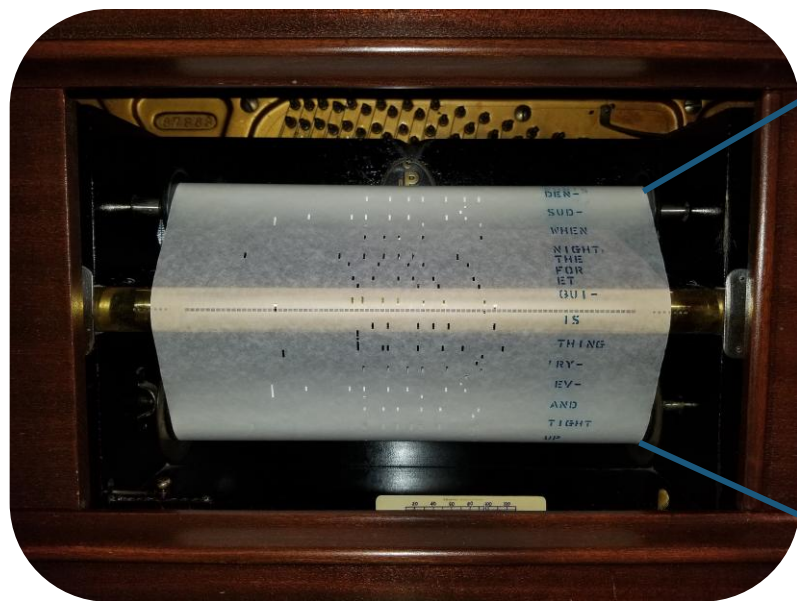
Moises Demo



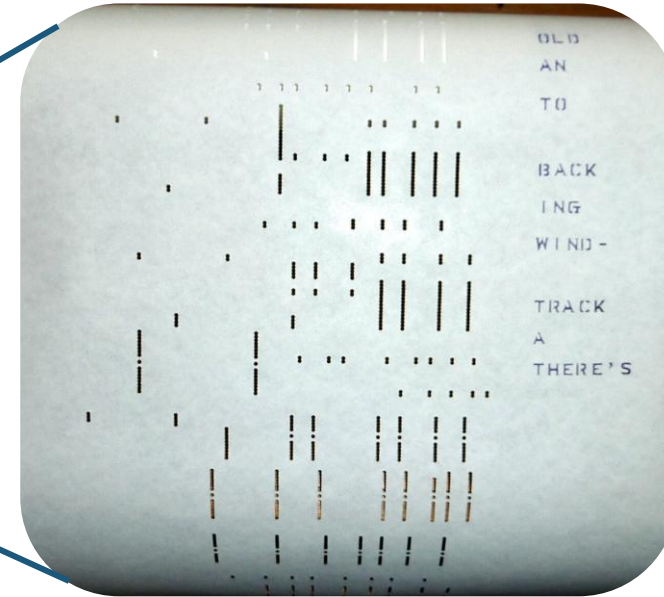
(Source: Moises)

Next Lecture

Music Processing Fundamentals



(Source: Draconichiaro via [Wikimedia Commons](#))



(Source: Tangerineduel via [Wikimedia Commons](#))