

# Sustainable Sounds

Interrogating the Materials of Music Making Technologies

Thomas Ciufo  
Mount Holyoke College

*DIY and One-Off Instruments*

*Unique Approaches to Electronic Musical Instrument Design*

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# Overview

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context / approach

the problem(s) of terminology

electronic musical instruments / design approaches

some comparisons / many remaining questions...

# Context / Approach

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# Context / Approach

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# The Problem with Terminology

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## **Sustainability...**

“*Sustainability* is a terrible—and terribly important—term

Without being defined at every turn, the term is at constant risk of confusion and misinterpretation; if it is (re)defined continually, it may mean everything and nothing” Aaron Allen

material / cultural / musical / technical ?

\* how to get beyond the focus on the material?

# The Problem with Terminology

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## **Sustainability...**

Five domains (Schippers)

systems of learning music

musicians and communities

context and constructs

regulations and infrastructures

media and the music industry



# The Problem with Terminology

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what is an **instrument** ? - a device (such as a violin, piano, or flute) used to make music...

Is it a technological result of culture? Is it a product of nature? (Dawe) Is it a cultural response to technology?

what is an **electronic musical instrument** ? - a musical instrument that produces sound using electronic circuitry...



# Instrument

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some action + some object = some sound



# Electronic Musical Instrument

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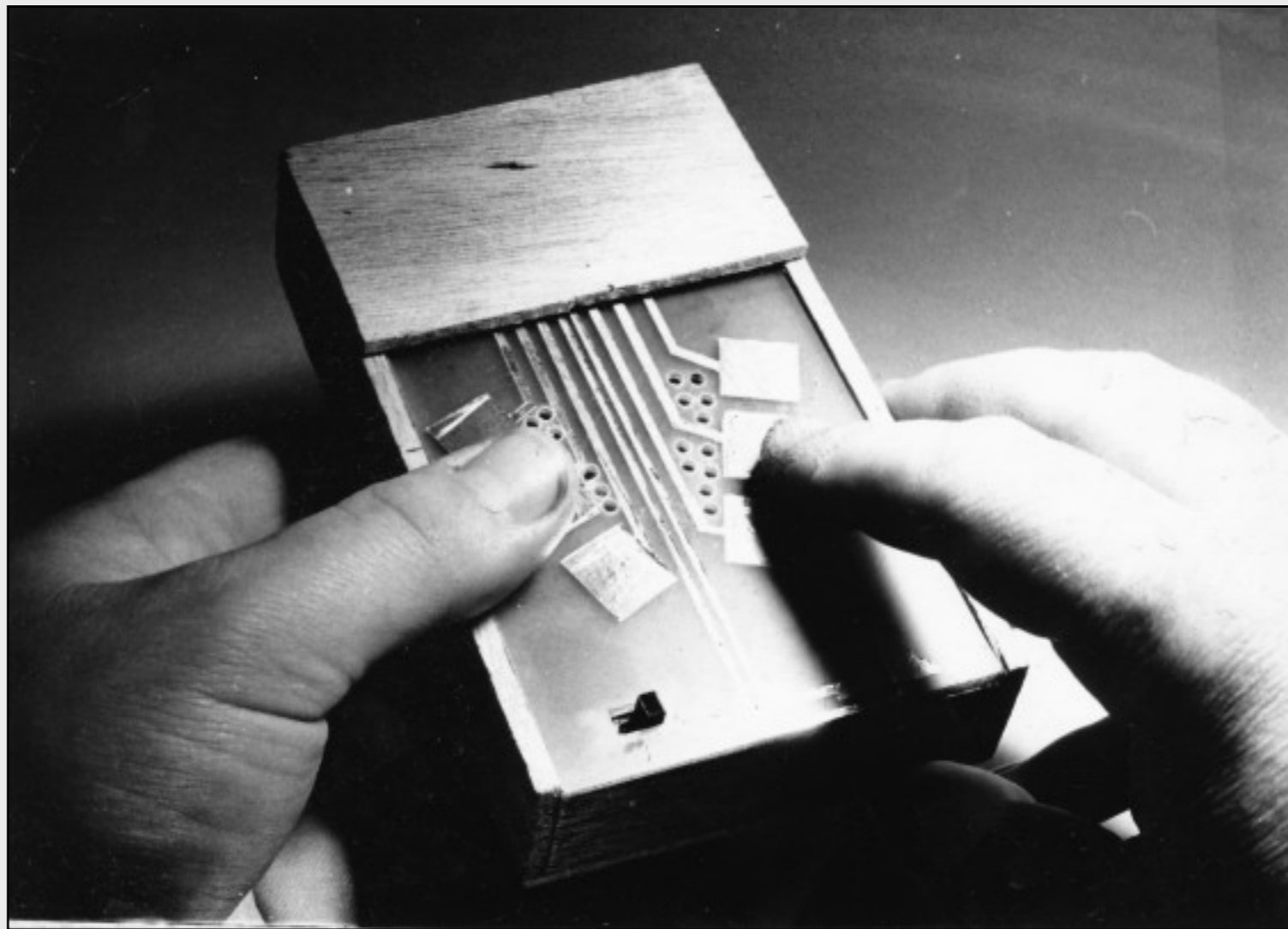
some action(?) + some system(?) = some sound



# Electronic Musical Instrument

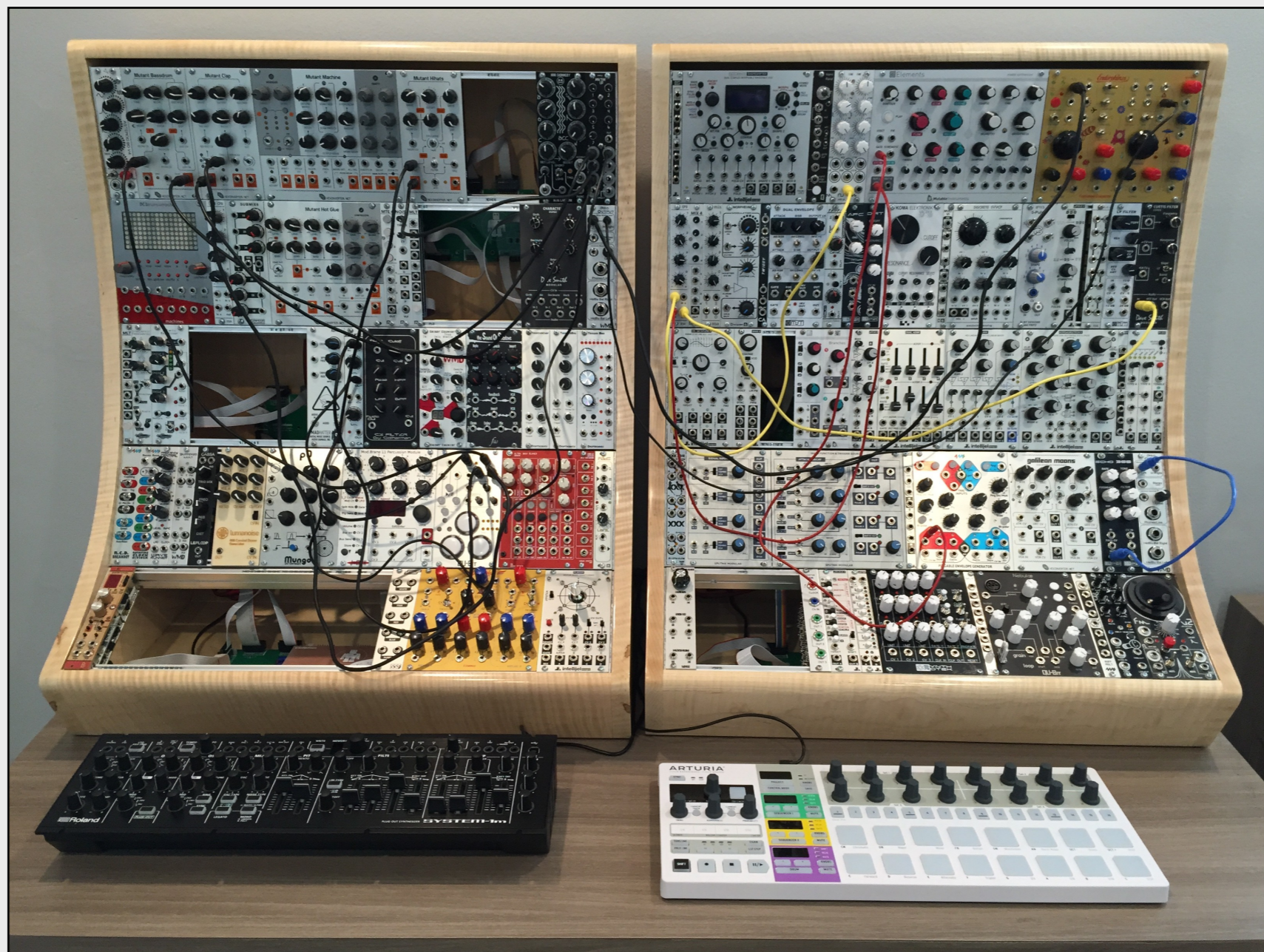
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some action(?) + some system(?) = some sound



# Electronic Musical Instrument

some action(?) + some system(?) = some sound



# Electronic Musical Instrument

some action(?) + some system(?) = some sound



# Electronic Musical Instrument(s)

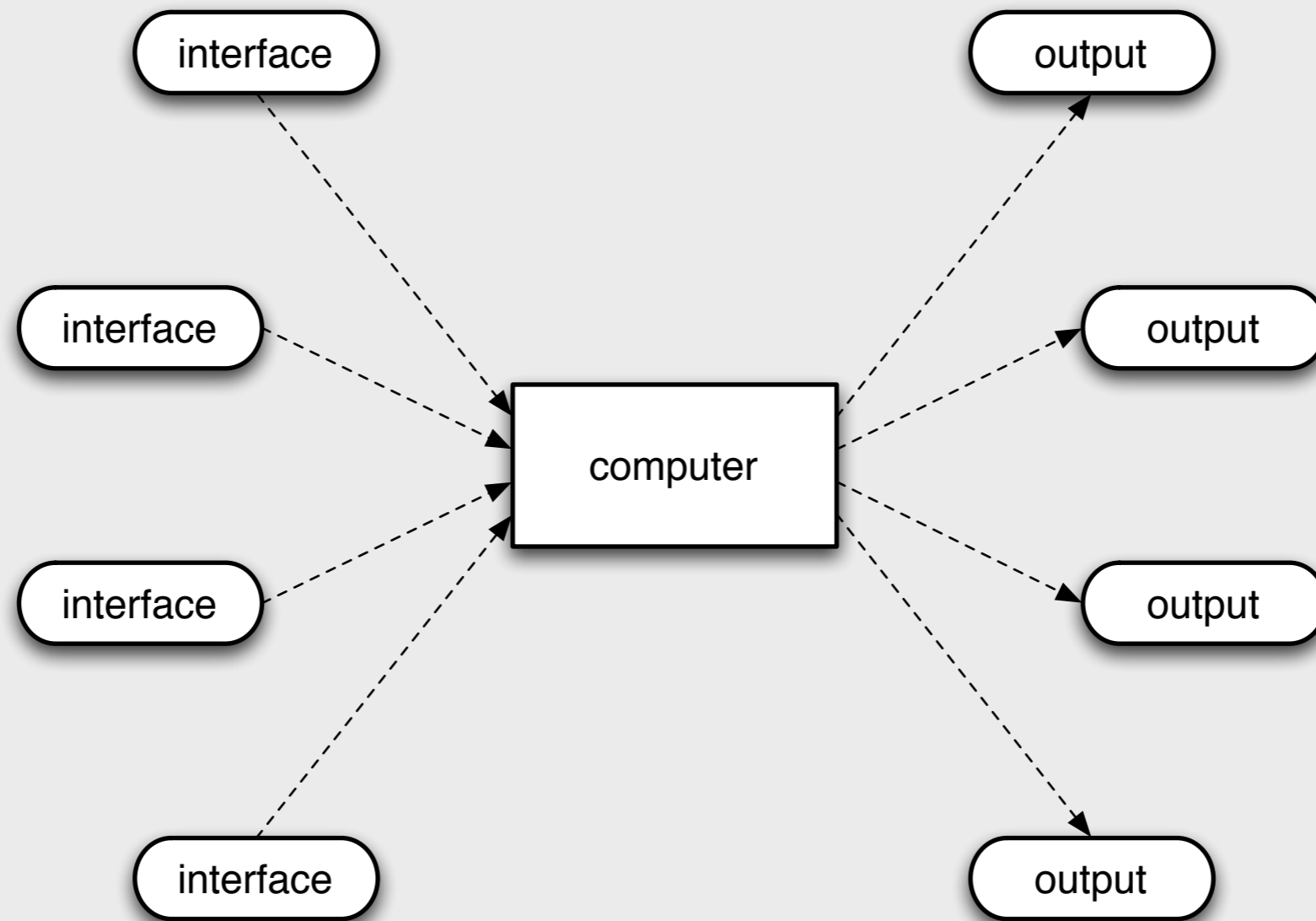
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some action(?) + some system(?) = some sound



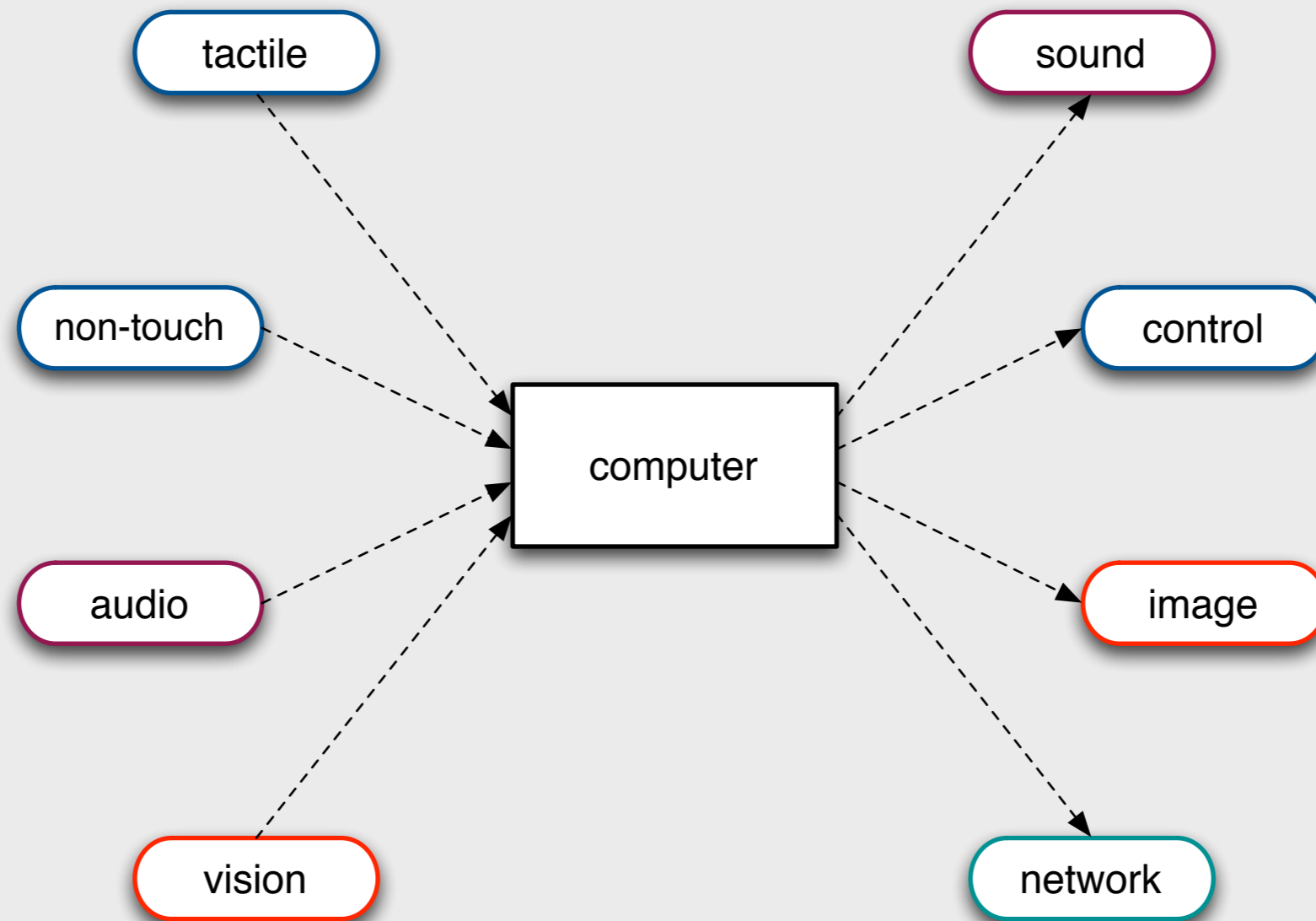
# Computer-Based Instrument

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# Computer-Based Instrument

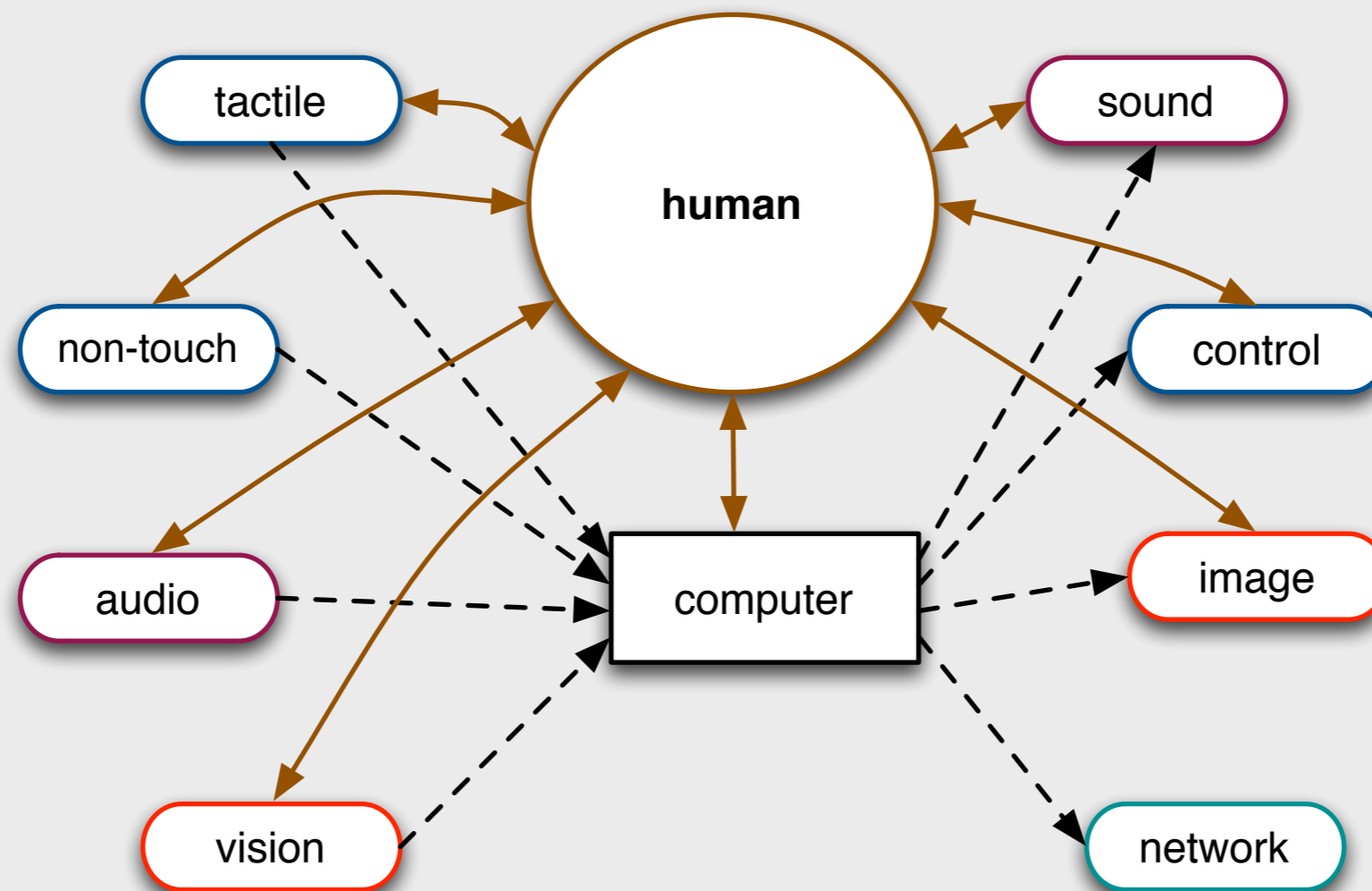
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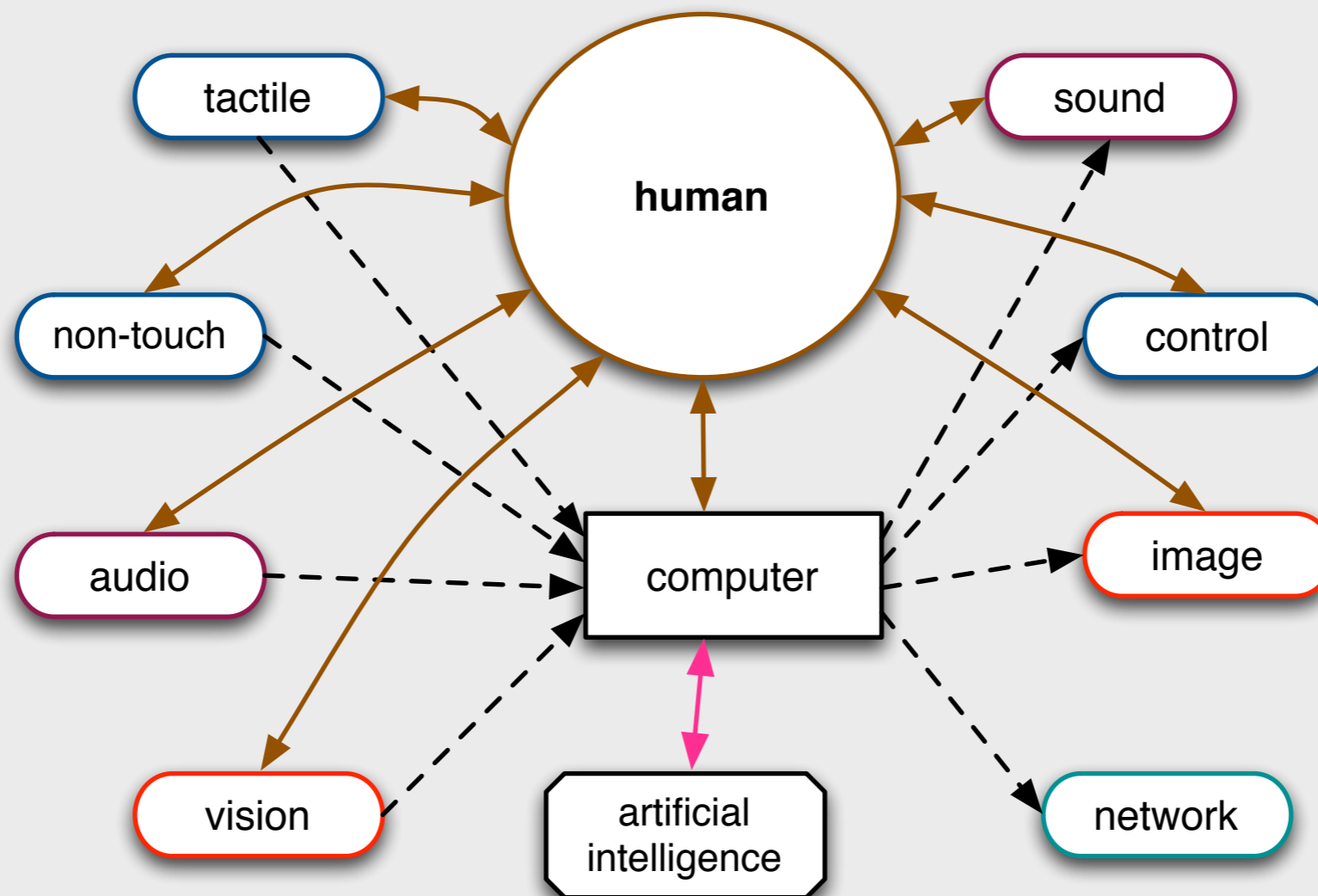
# Computer-Based Instrument

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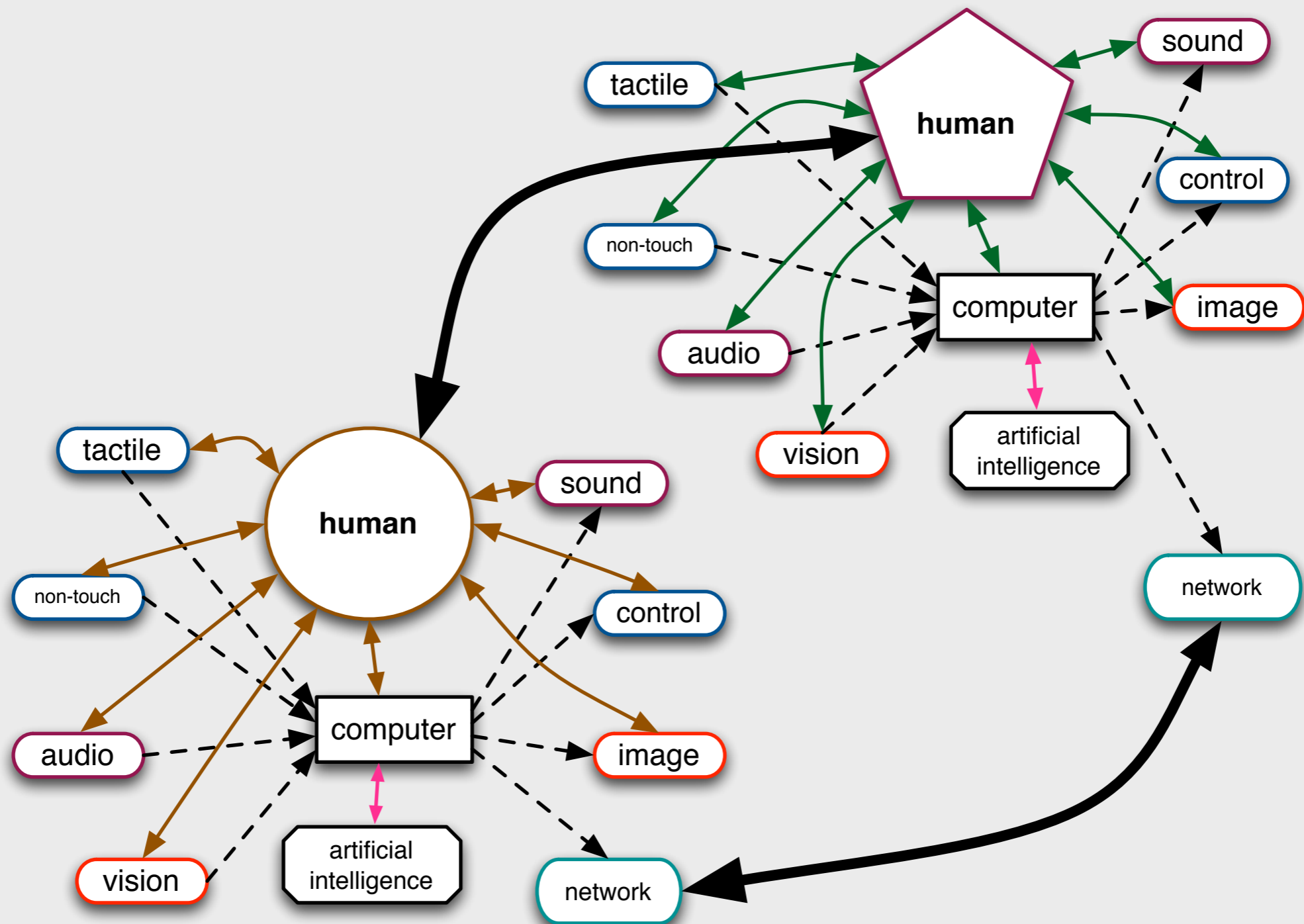


# Computer-Based Instrument + AI

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# Ensemble / Distributed Performance



# Instrument / Interaction Models

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hyperinstrument (Machover)

expanded instrument system (Oliveros)

composed instrument (Wanderley, Schnell, Bahn etc)

computer-mediated instrument (Ciufo)

# Practical Design / Case Examples

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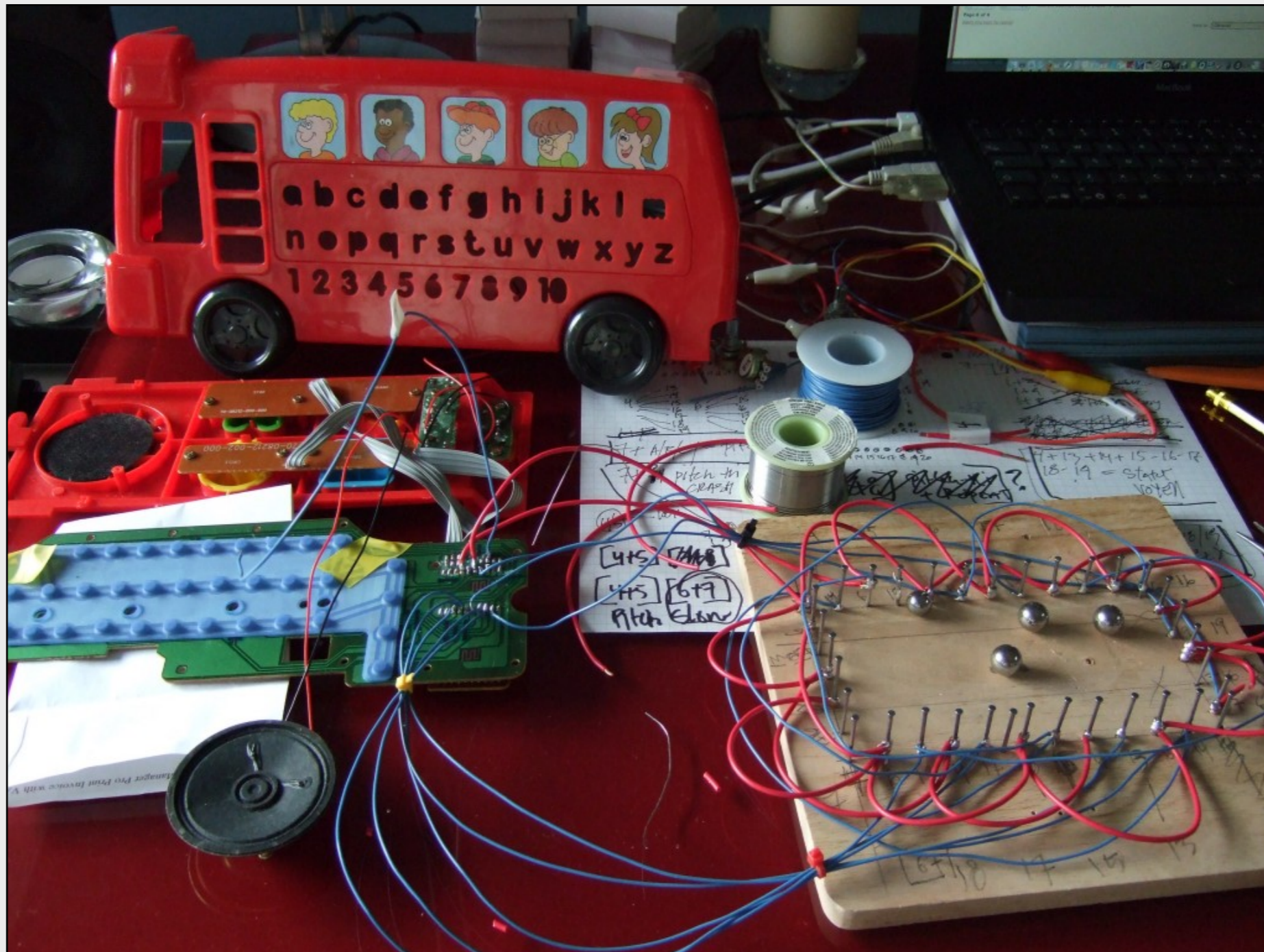


# Michel Waisvisz Crackle Box

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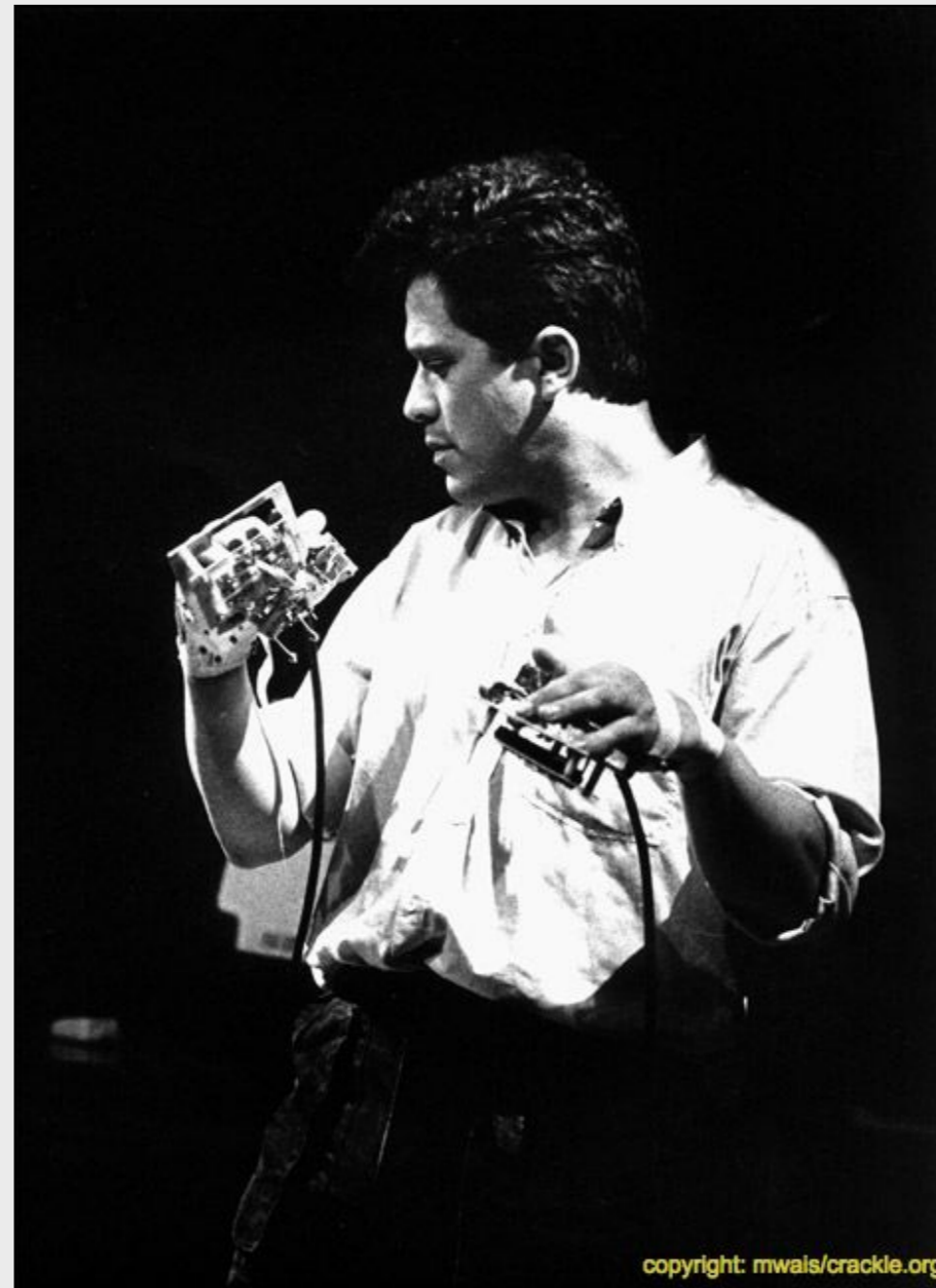


# Circuit Bending



# Michel Waisvisz The Hands

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# Michel Waisvisz The Hands

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# Michel Waisvisz The Hands

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# Laetitia Sonami Ladies Glove

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# Laetitia Sonami Ladies Glove

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# Laetitia Sonami Ladies Glove

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# Laetitia Sonami Ladies Glove

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# Laetitia Sonami Ladies Glove

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# Imogen Heap The Gloves

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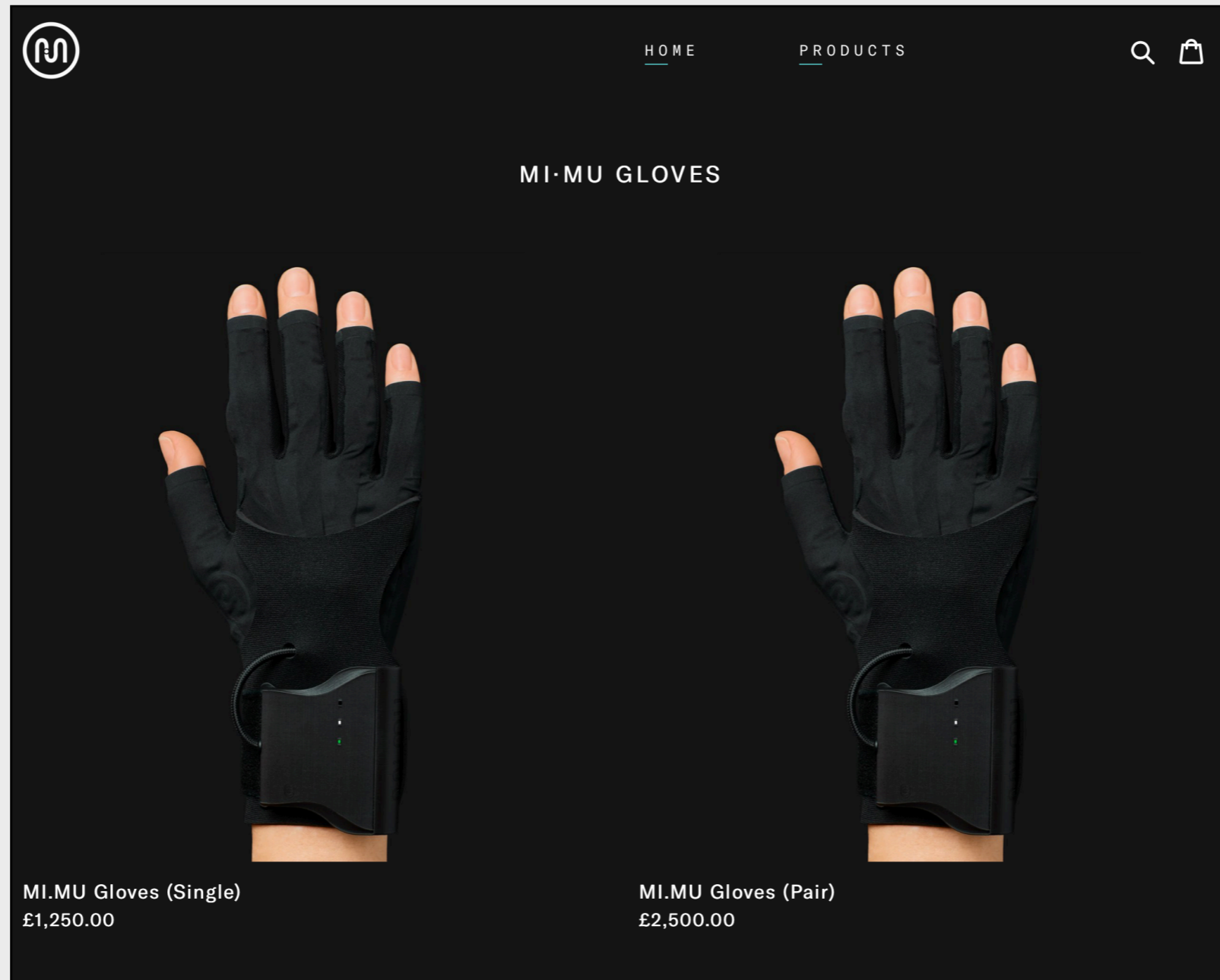


# Imogen Heap The Gloves

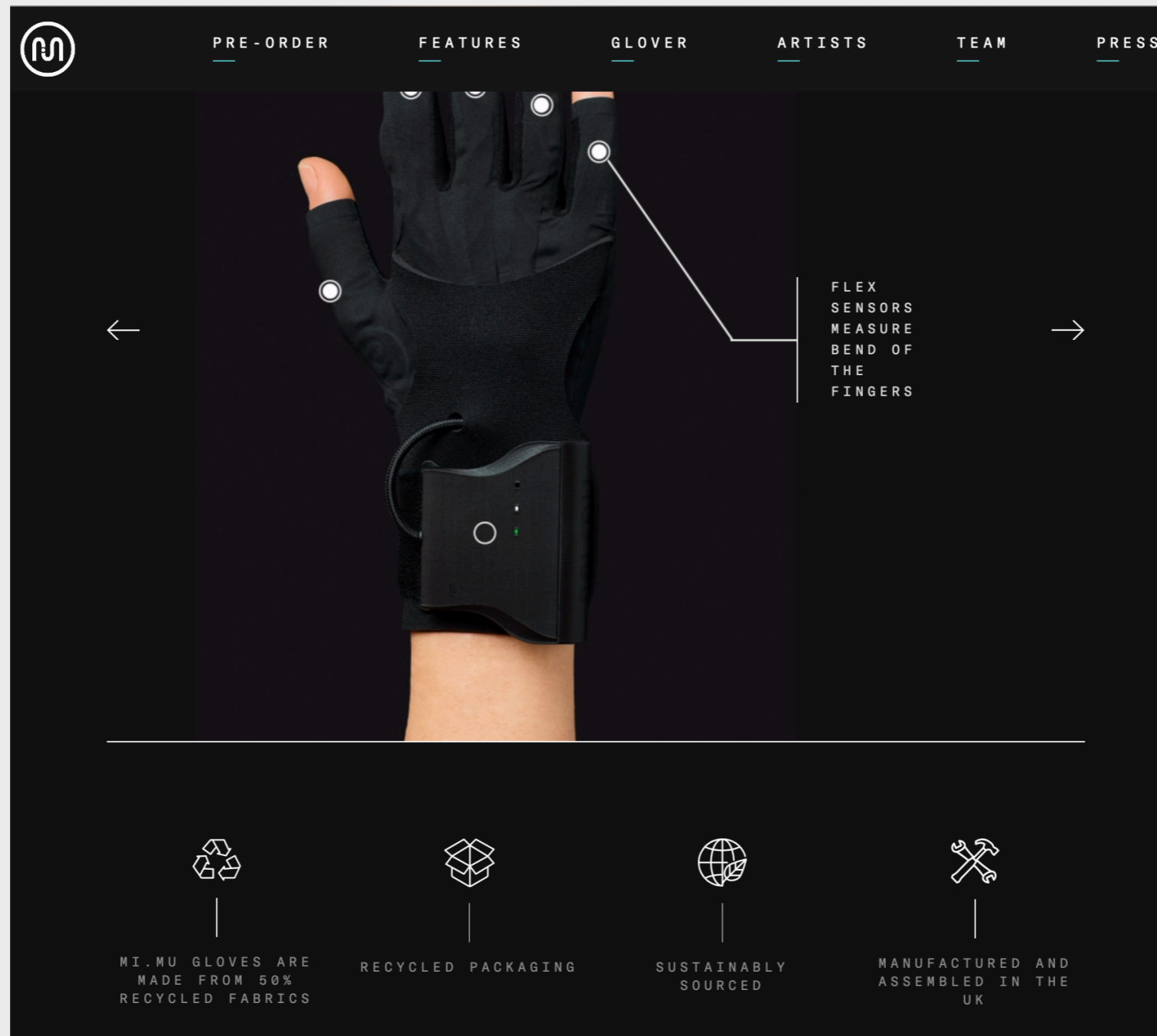
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# Imogen Heap The Gloves / Mi Mu

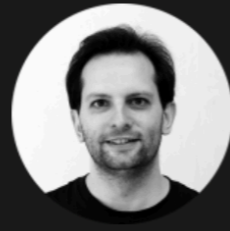


# Imogen Heap The Gloves / Mi Mu



# Imogen Heap / Mi Mu Team

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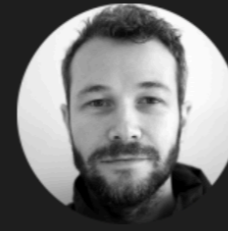
**Adam Stark**

MANAGING DIRECTOR



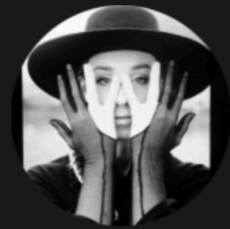
**Imogen Heap**

CREATIVE DIRECTOR



**Tom Mitchell**

SOFTWARE



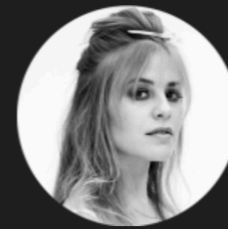
**Rachel Freire**

TEXTILES / ARTISTIC  
DIRECTION



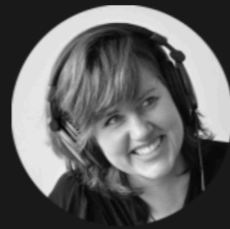
**Seb Madgwick**

ELECTRONICS /  
SENSORS



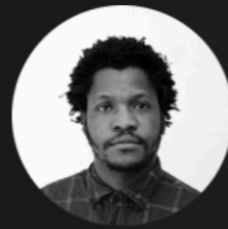
**Chagall van den  
Berg**

UX / USER INTERFACE



**Kelly Snook**

SYSTEMS ENGINEER /  
DIY PROGRAMME



**Nigel Mphisa**

BUSINESS DEVELOPMENT  
/ GROWTH



**Hannah Perner-  
Wilson**

TEXTILES /  
ELECTRONICS

# Ariana Grande / Mi Mu Gloves

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# Eighth Nerve Guitar

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# Hybrid Design - Eighth Nerve Guitar

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instrument specific gestural controls +  
pedals and iPad - primarily metalevel

context awareness / audio analysis

analysis informed autonomous behaviors

memory / playback system + timbre matching

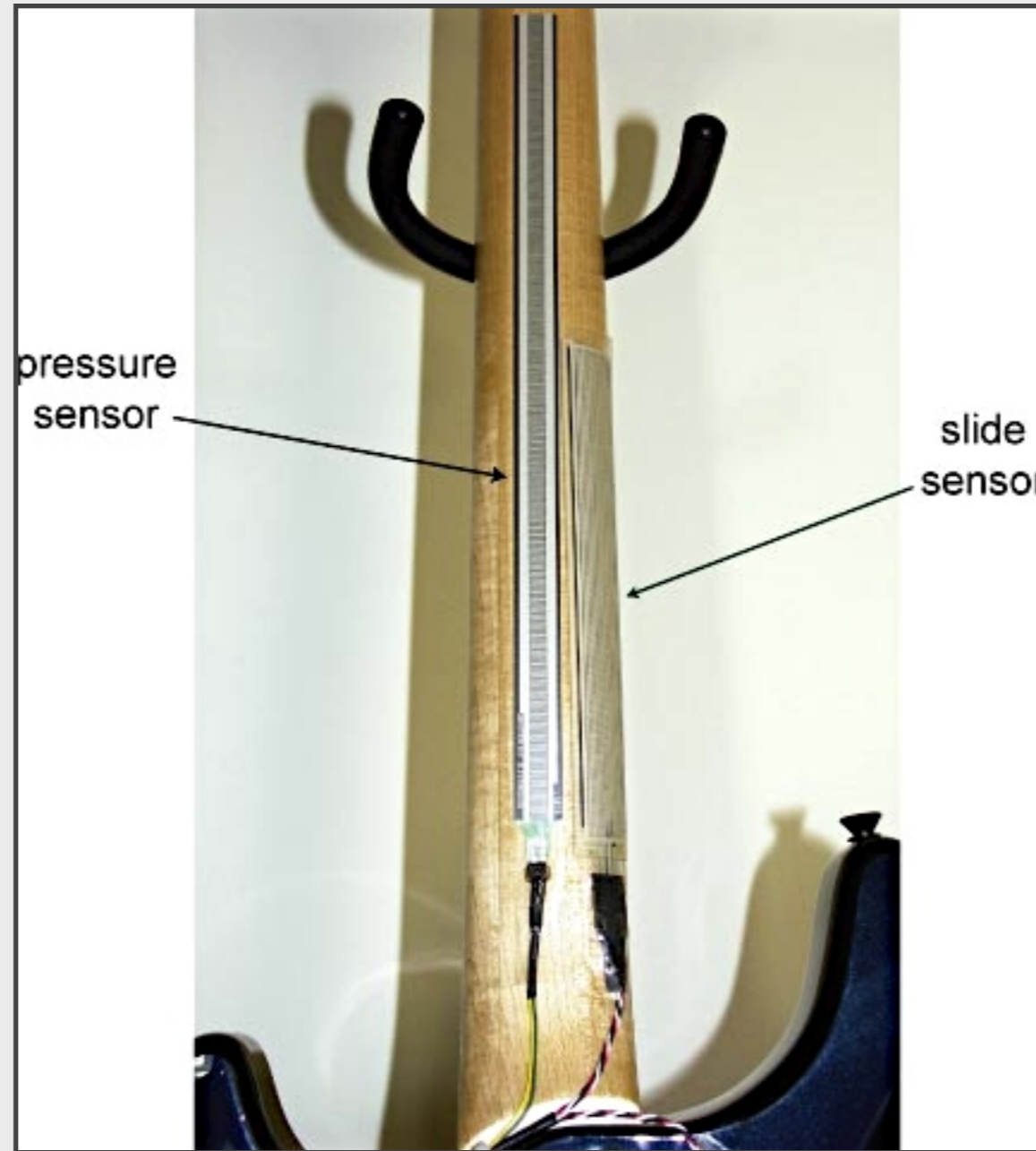
# Composed Instrument - Eighth Nerve Guitar





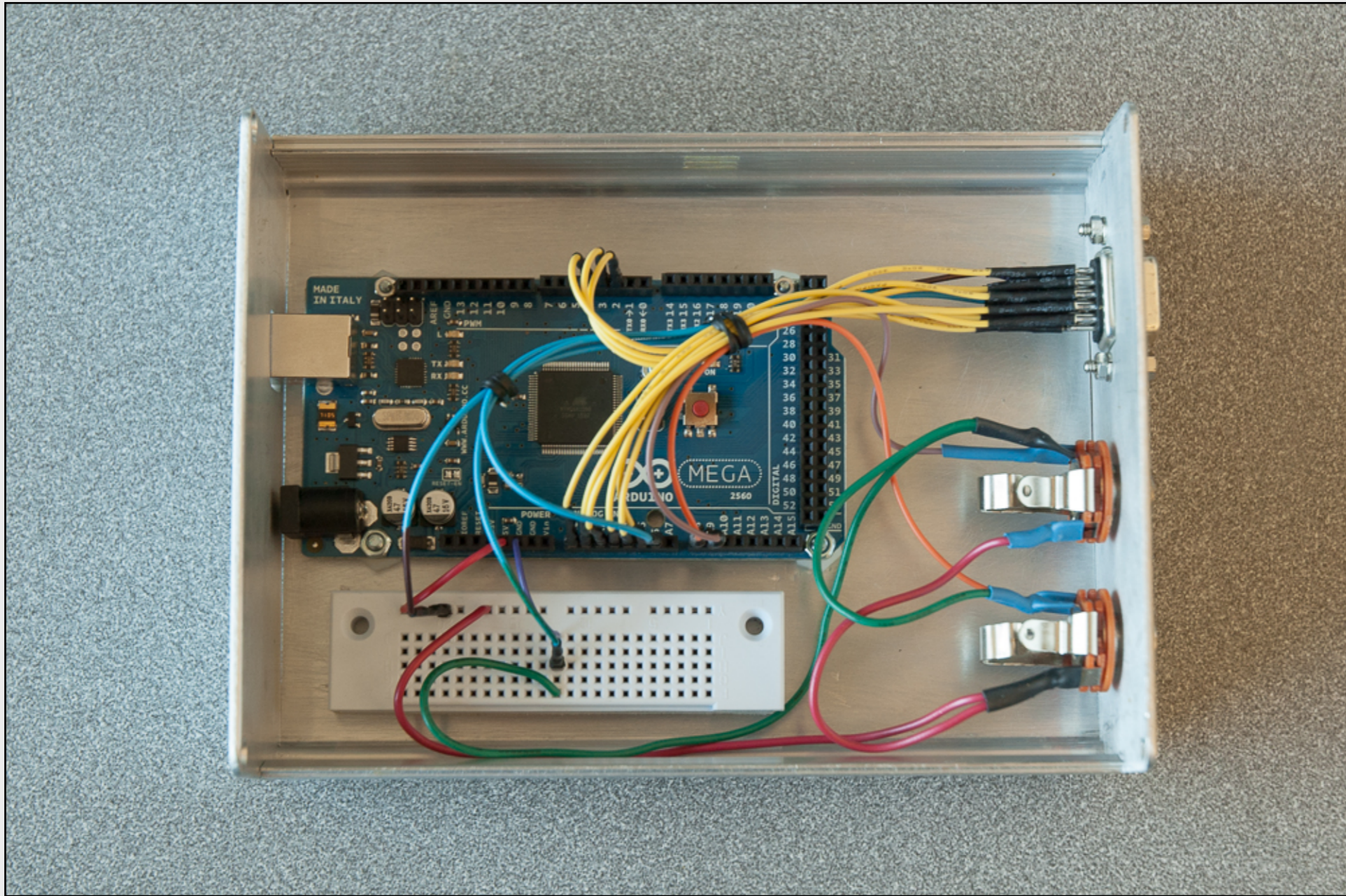
# Composed Instrument - Eighth Nerve Guitar

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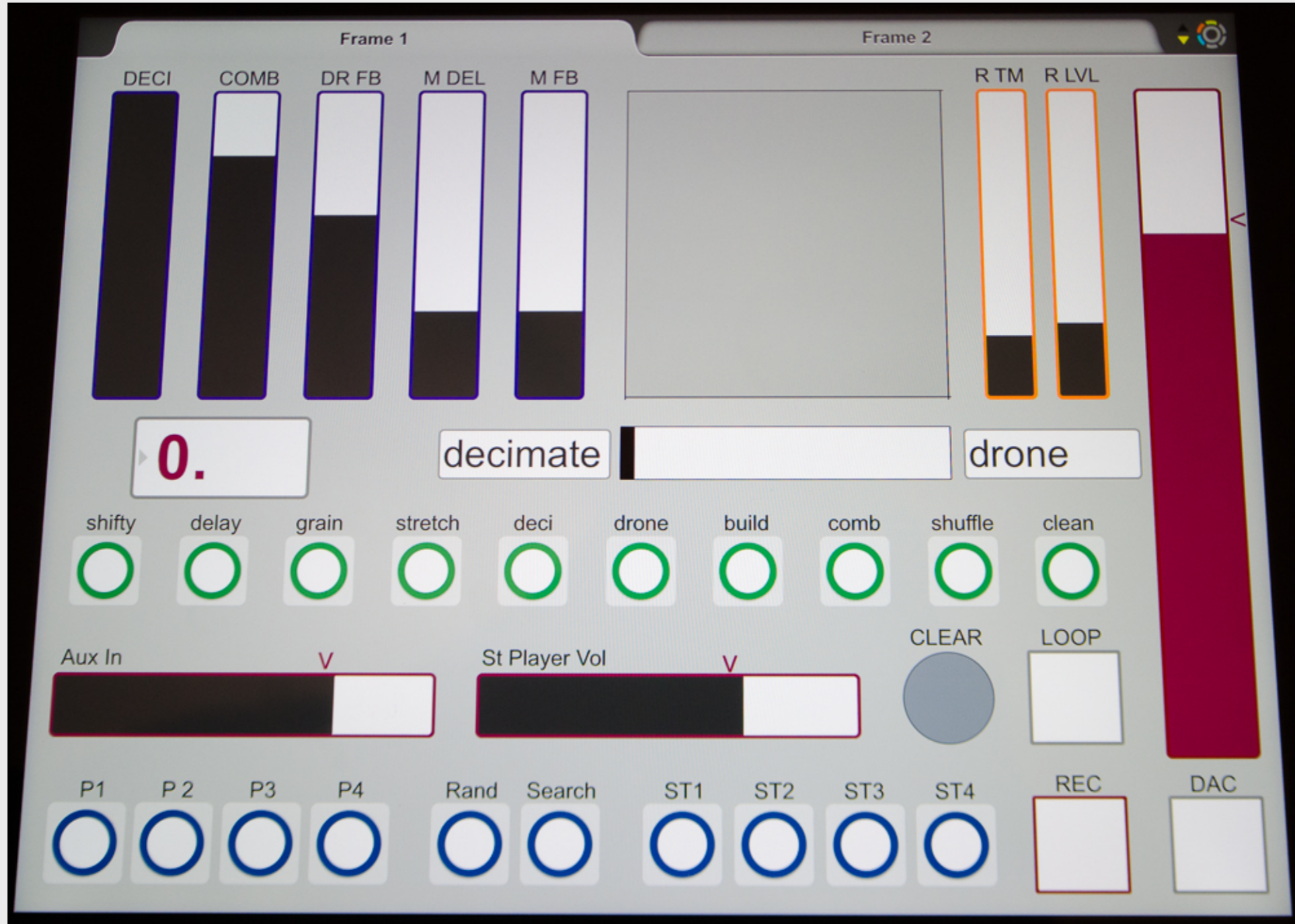


# Composed Instrument - Eighth Nerve Guitar

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# Composed Instrument - Eighth Nerve Guitar



# *Point, Line, Shape*

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# *Silent Movies*

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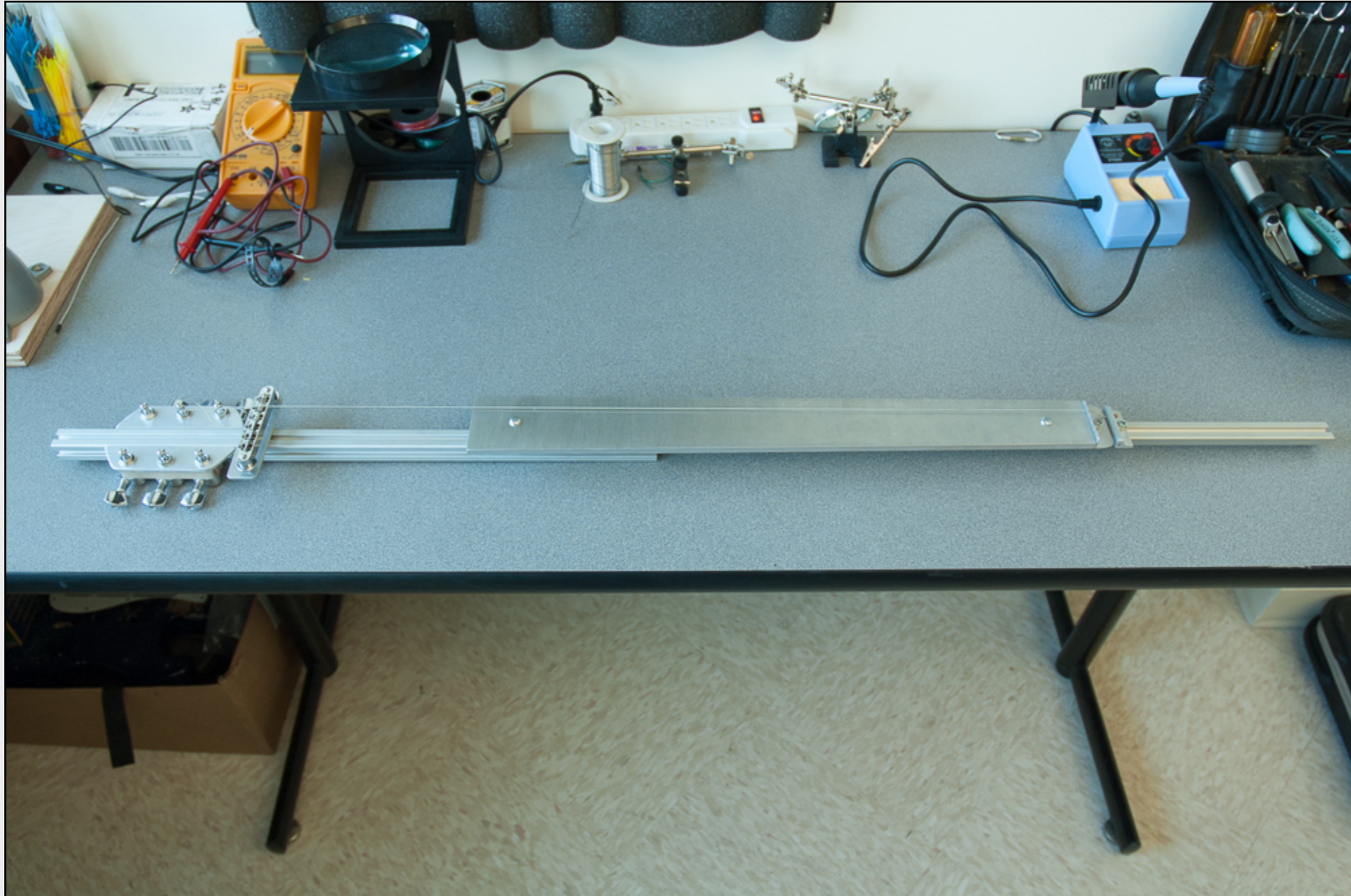
# *Second Dialogue*

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# Guitar-Like Object

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# Guitar-Like Object

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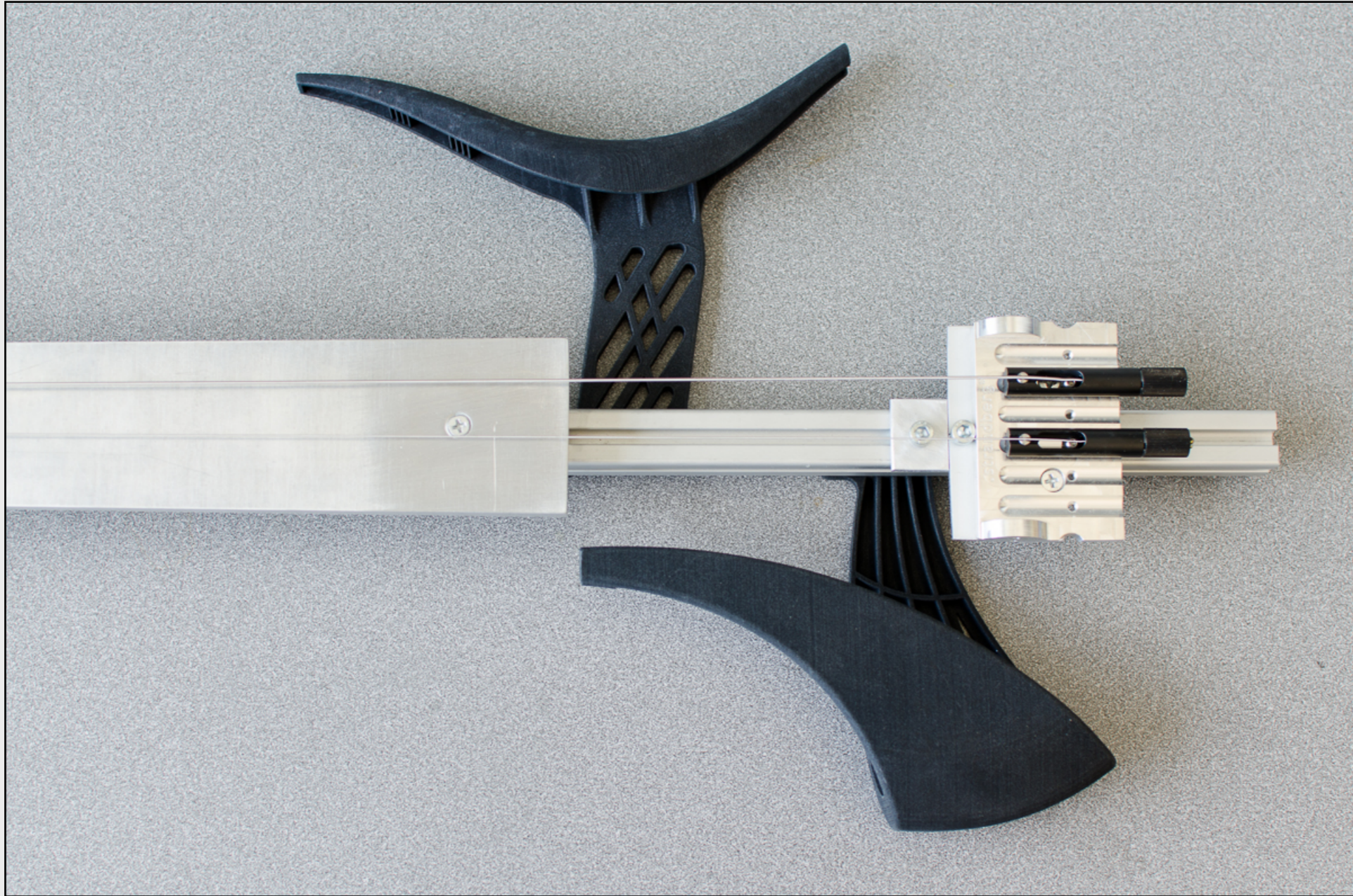
# Guitar-Like Object

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# Guitar-Like Object

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# Guitar-Like Object

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# Challenges....

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combining the responsibilities of instrument maker /  
composer / performer poses unique demands

systems can be difficult to maintain

not easy to play

reconfigurable can mean ever changing

no one to blame but myself...

# Benefits / Possibilities

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real-time access to a complex and malleable sound pallet

combine compositional structures, navigable spaces, and spontaneous invention during performance

design instruments / systems that reflect a unique musical aesthetic or approach to performance

redefine / reenvision creative practice

\*propositional music (Rosenboom)

sustainability can be a central design criteria

# Instruments / Electronic Instruments

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acoustic

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electronic

predictable / consistent	unique / idiosyncratic
usable by many	maybe just for one person
somewhat independent of stylistic purpose / use	instrument may be just for one 'piece'
manufacturable ?	DIY / custom
made by instrument maker	made by performer / composer
durable / should have longevity	one-off / sometimes short term
physical	digital / virtual?
sustainable?	sustainable?

# Thanks for Listening!

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Thomas Ciufu  
[www.ciufu.org](http://www.ciufu.org)