Drawing Machines

An Arts and Engineering Collaboration

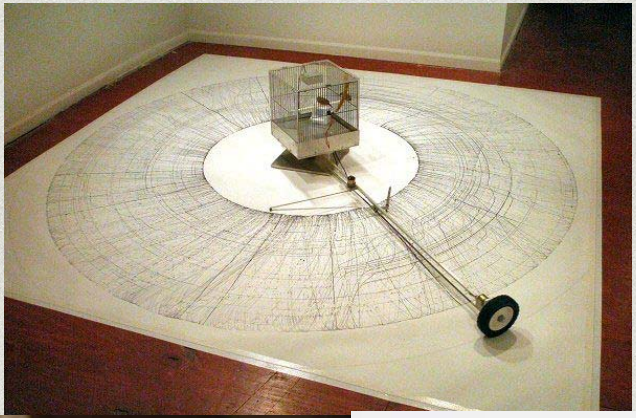
Erik Brunvand

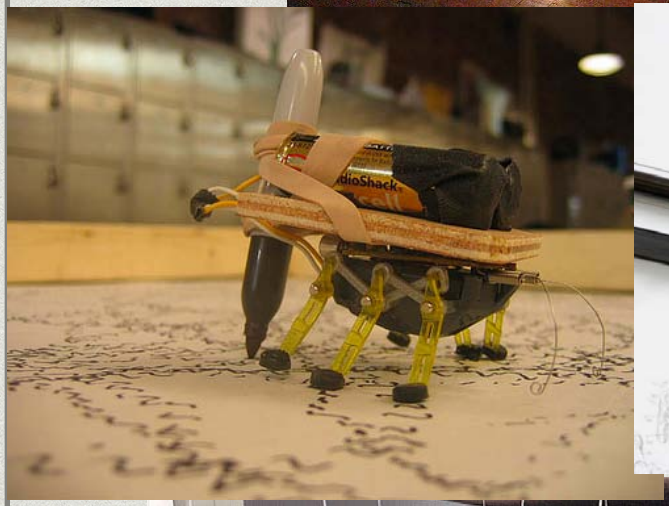
Saltgrass Printmakers
& University of Utah

THE UNIVERSITY OF UTAH

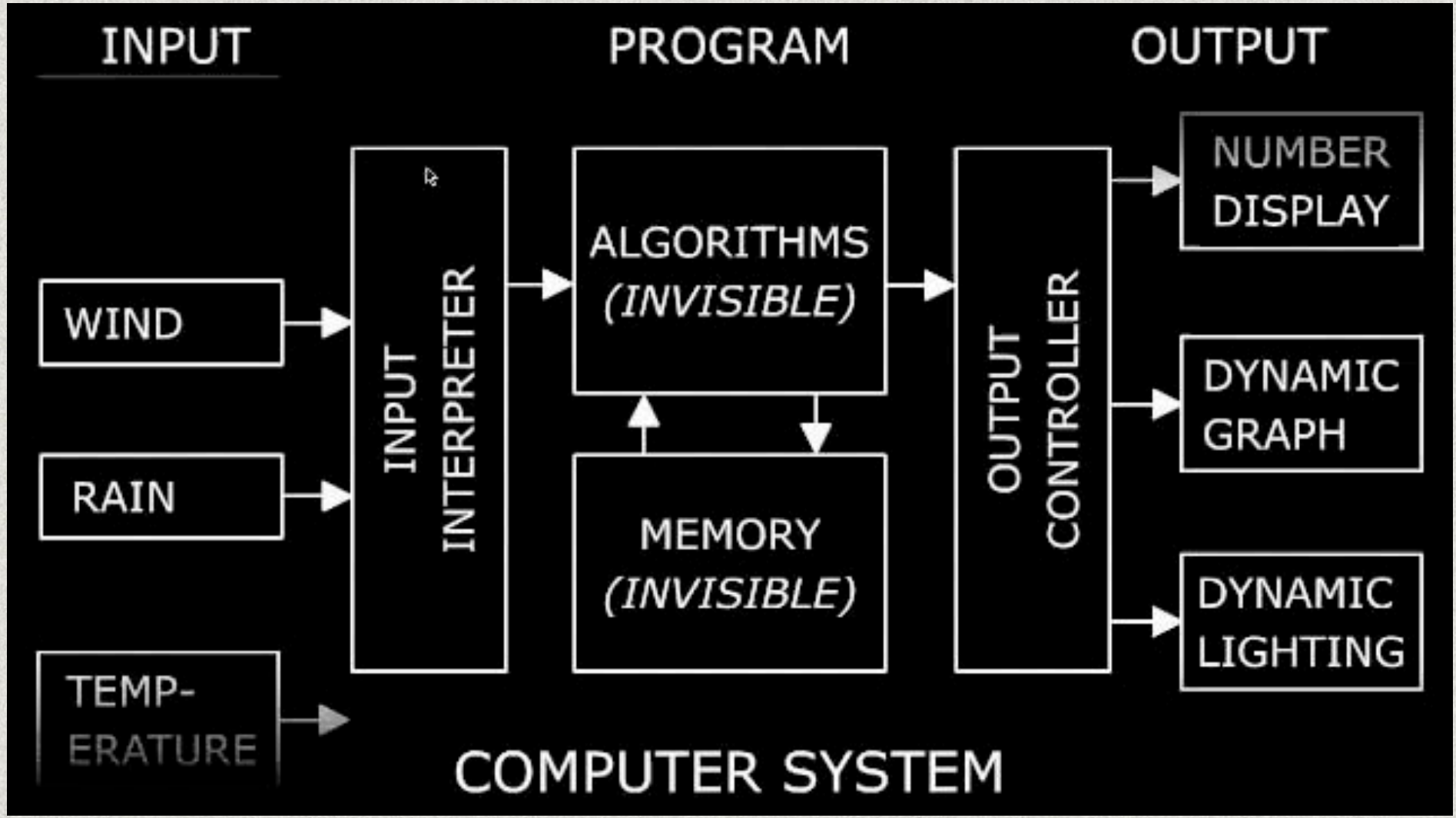
SaltGrass PRINTMAKERS

Drawing Machines





Jim Campbell's Algorithm



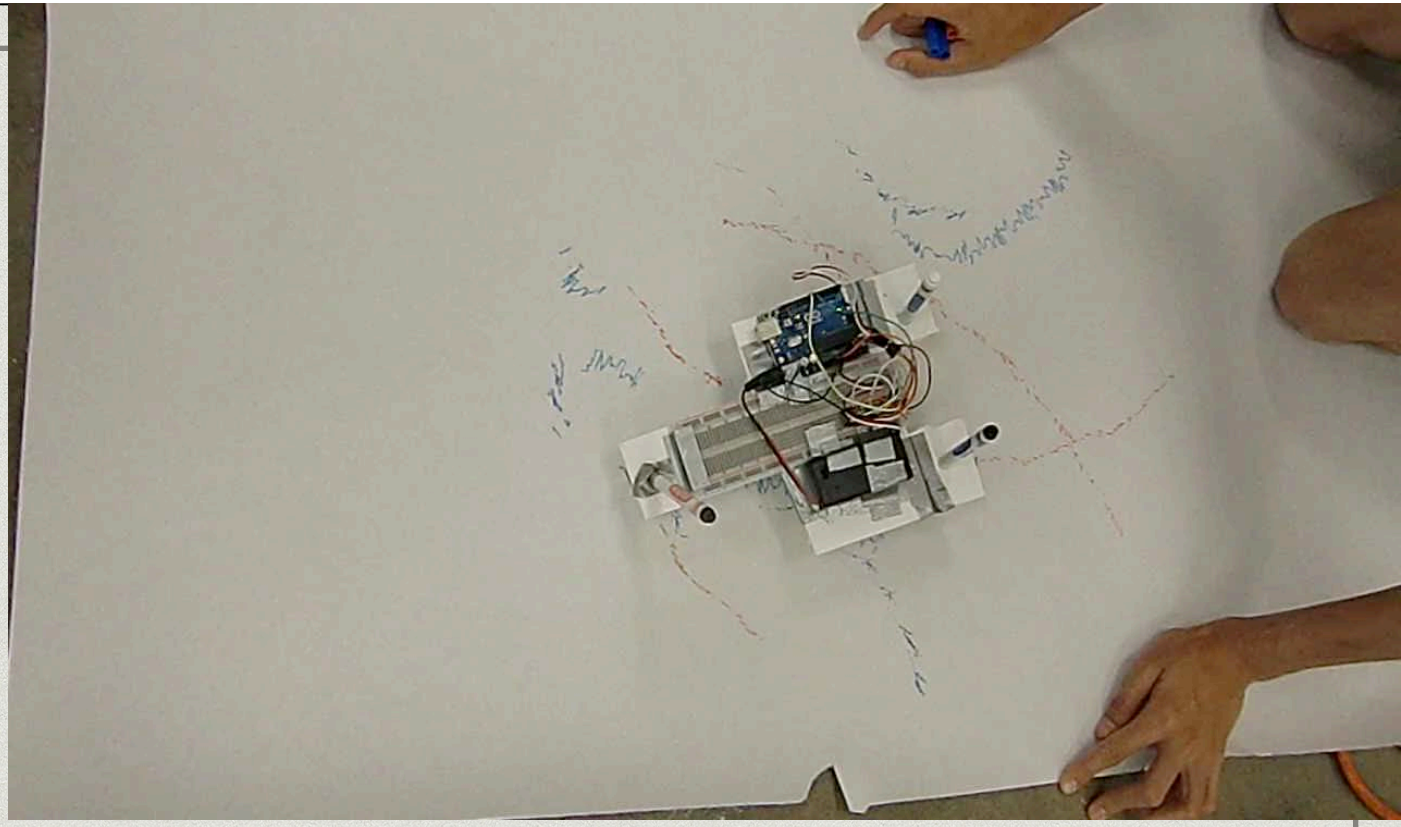
Automated Drawing

- Drawings made with mechanisms
  - Repeatable?
  - Controllable?
  - Editionable?
- Based on data?
  - Or made to be as random as possible?

Mike Lyon, Kansas City, MO

http://mlyon.com/

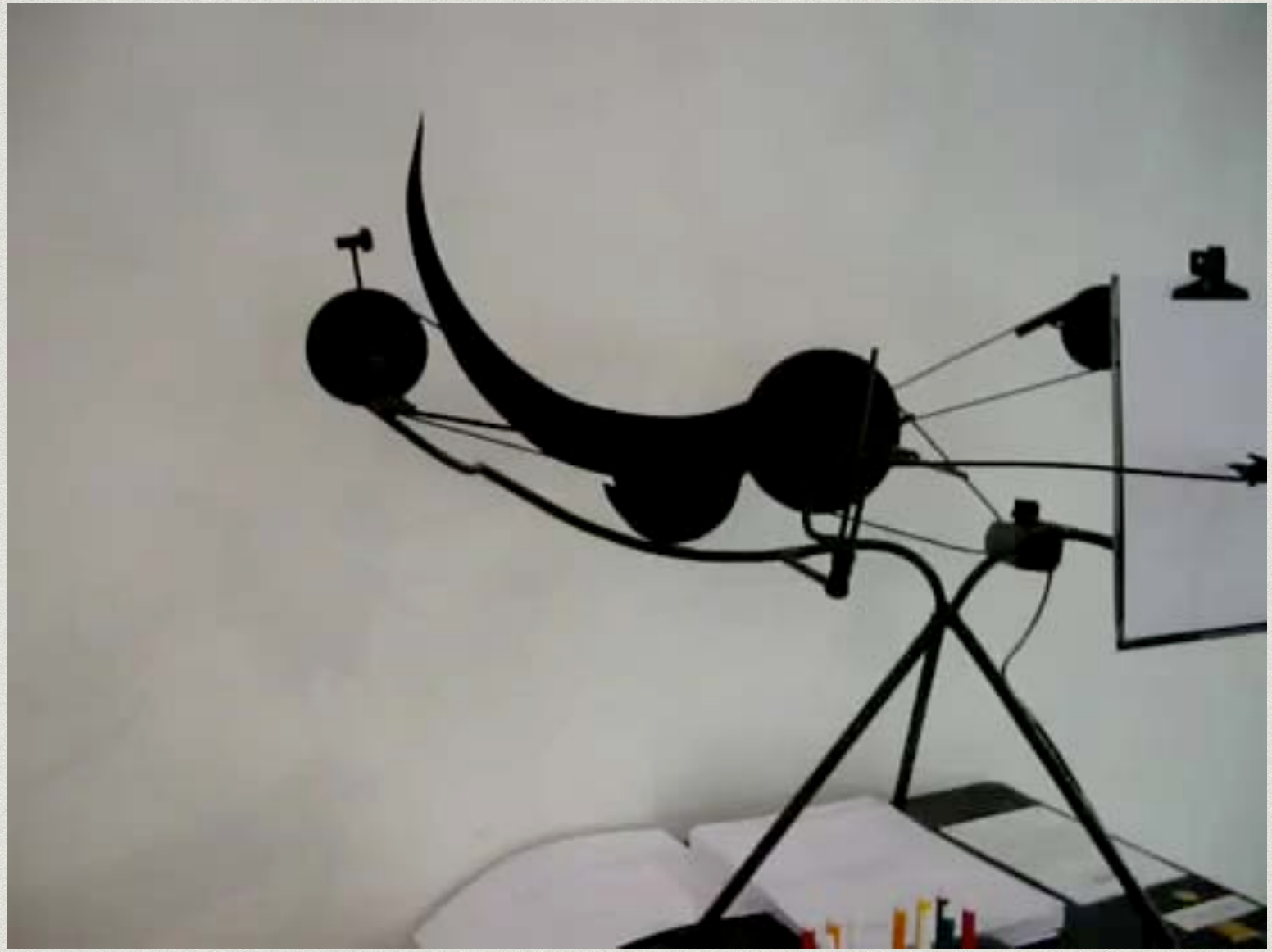
This Talk



Student from Trinity Valley School workshop

- Start with some images
  - To whet your appetite
- Think about an automated drawing taxonomy
  - Time Line: historical, computer age, and contemporary
  - Not intended to be comprehensive
- End with some examples of workshop machines

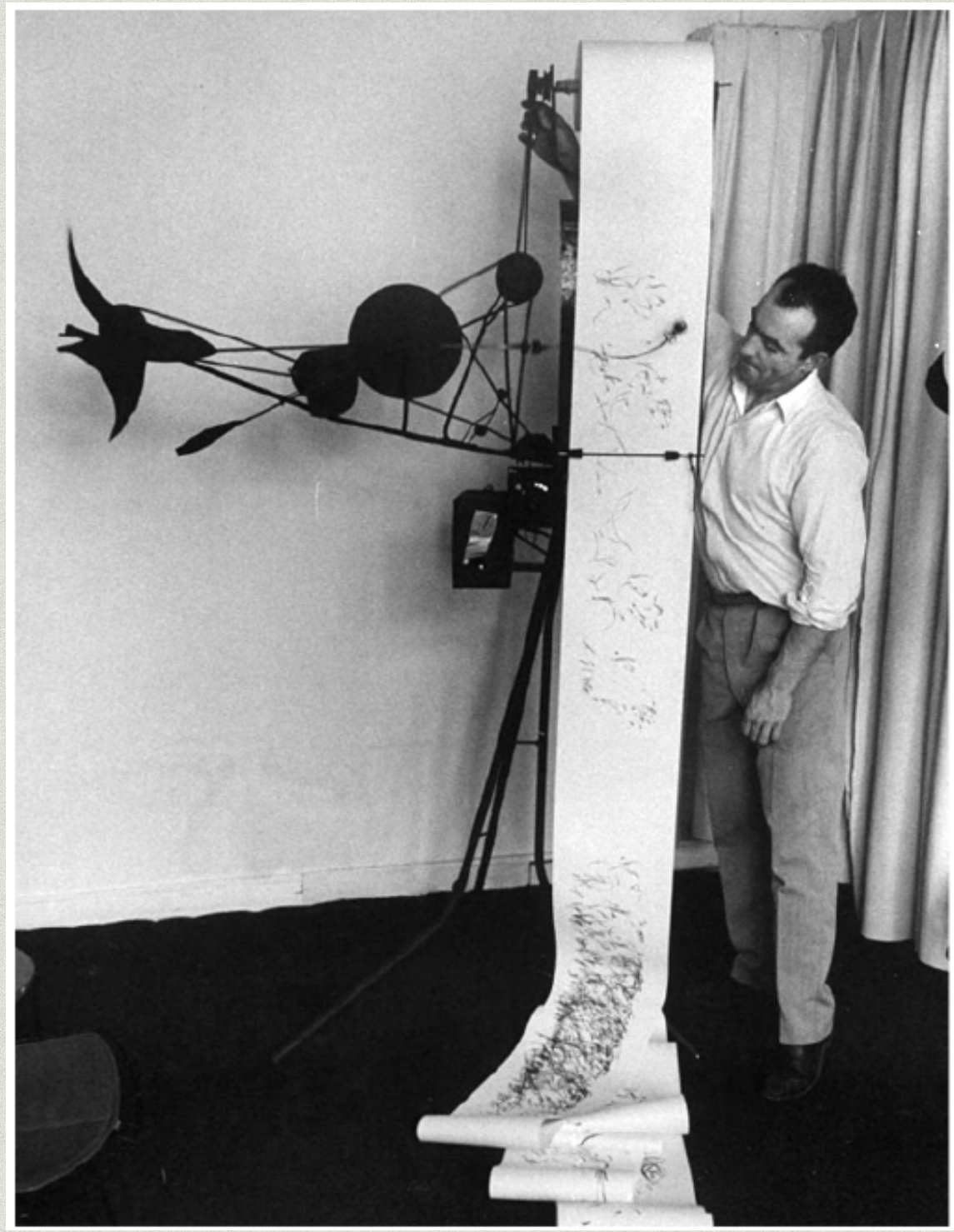
Jean Tinguely - Switzerland, 1959



http://www.youtube.com/watch?v=GOo5uq2fH6g

Jean Tinguely

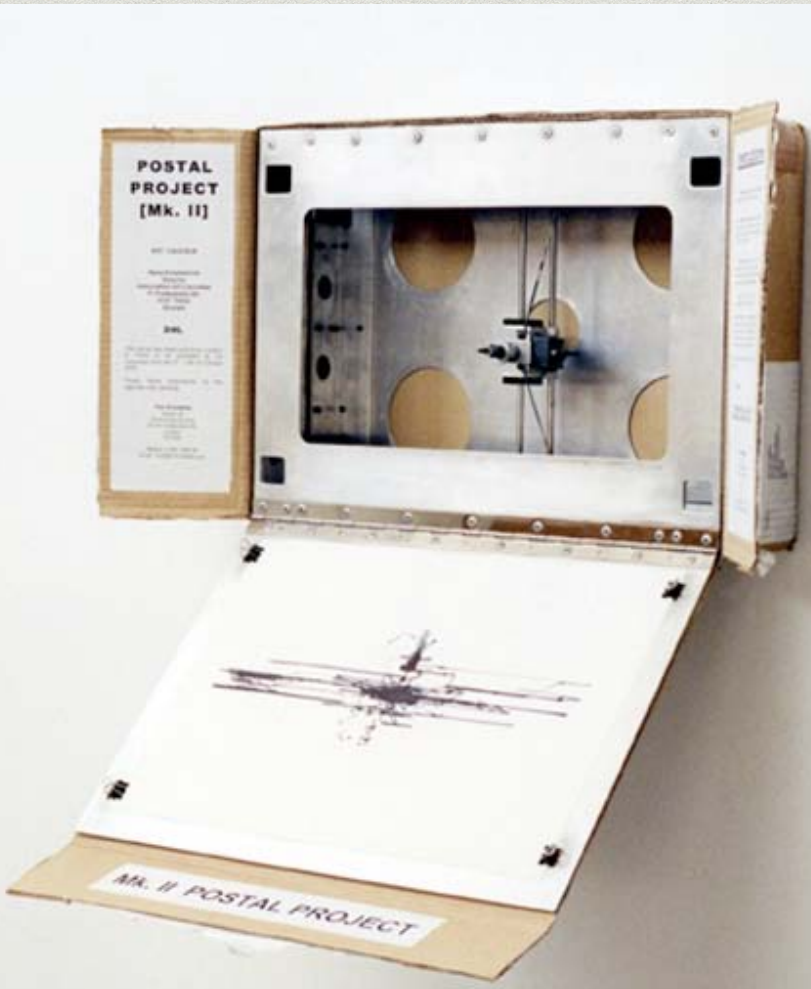
Metamatics



Eske Rex - Denmark (2011)

http://www.youtube.com/watch?v=5yumD0ezoVE

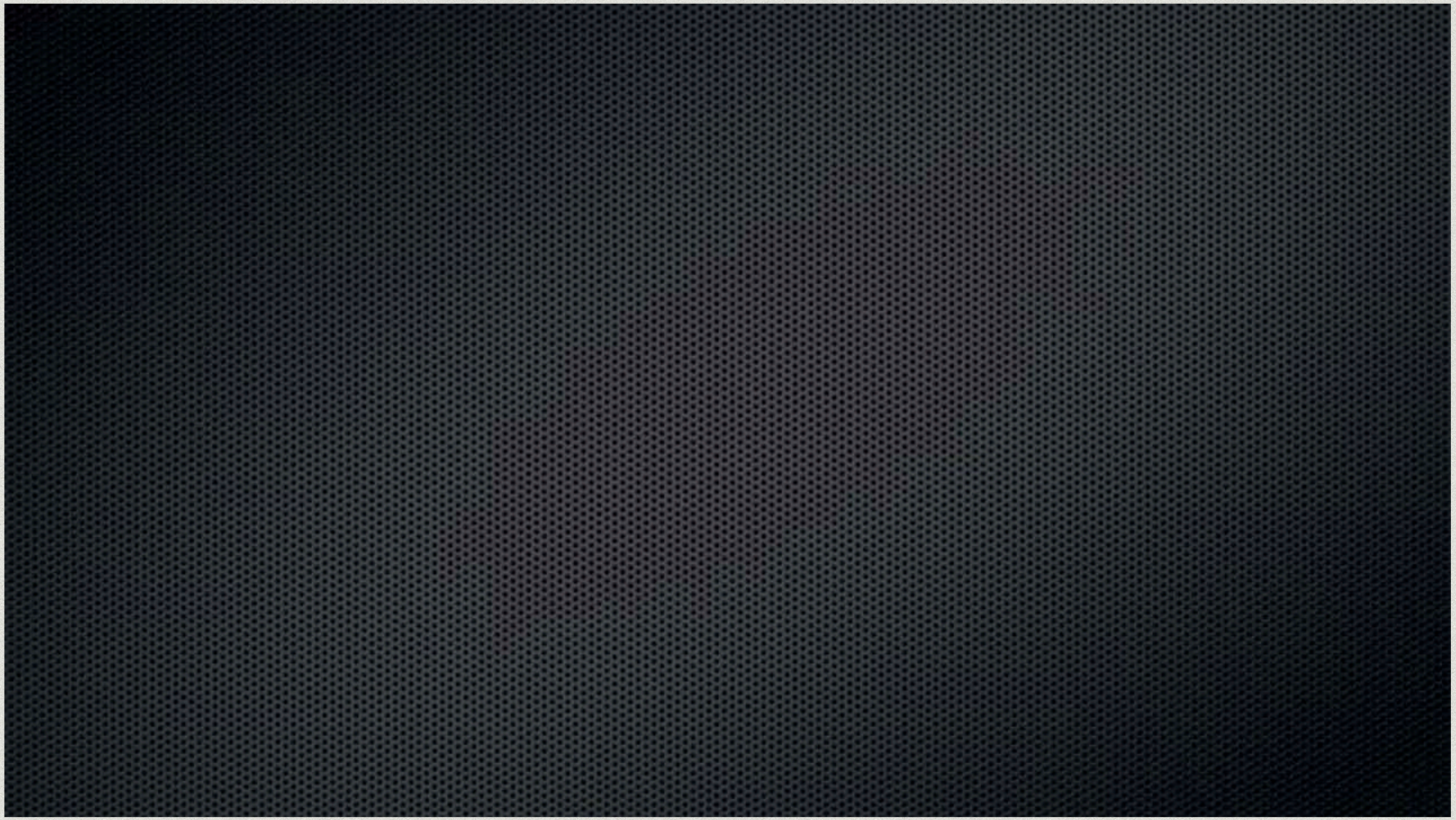
Tim Knowles - England, 2006



www.timknowles.co.uk

http://www.bitforms.com/tim-knowles-gallery.html

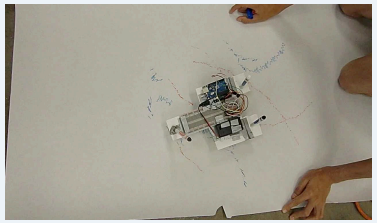
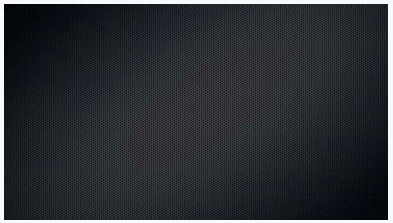
Erik Brunvand - USA, 2013



A Drawing Machine Taxonomy

Image \ Control	*Analog (mechanical)*	*Digital (electronic)*
Random	*Random marks with direct control of the drawing tool*	*Computer control, often using environmental input*
Deterministic	*Mechanical drive of the drawing tool*	*Computer programmed control*

A Drawing Machine Taxonomy

Control / Image	Analog (mechanical)	Digital (electronic)
Random	*Tim Knowles* *Jean Tinguely* 	*Student from Trinity Valley School* 
Deterministic	*Erik Brunvand* 	*Mike Lyons* 

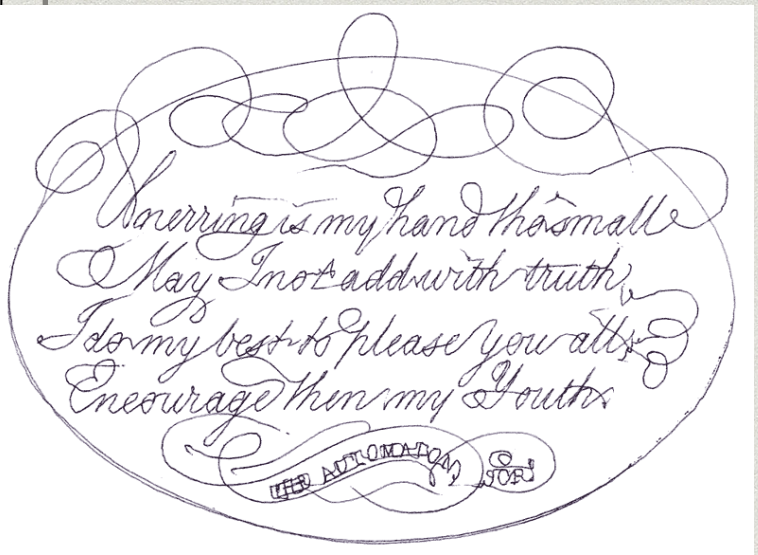
A Time Line

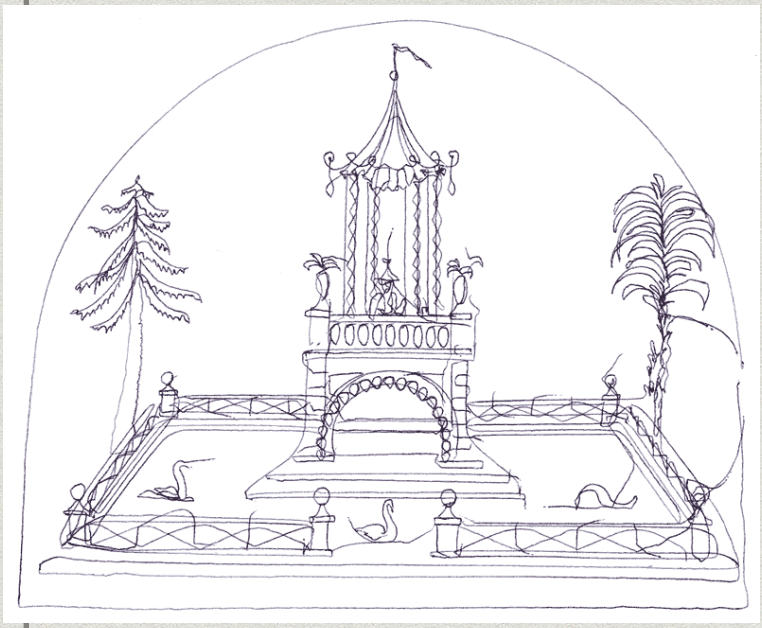
- Historical: 18th and 19th centuries (automata)
- Early Modern: 1950's (Metamatics)
- Computer Age: 1960's – 1970's (printers/plotters)
- Contemporary: 1990's to Now (lots of artists!)

Maillardet's Automaton, 1810

http://www.fi.edu/learn/sci-tech/automaton/automaton.php?cts=instrumentation

Maillardet's Automaton, 1810

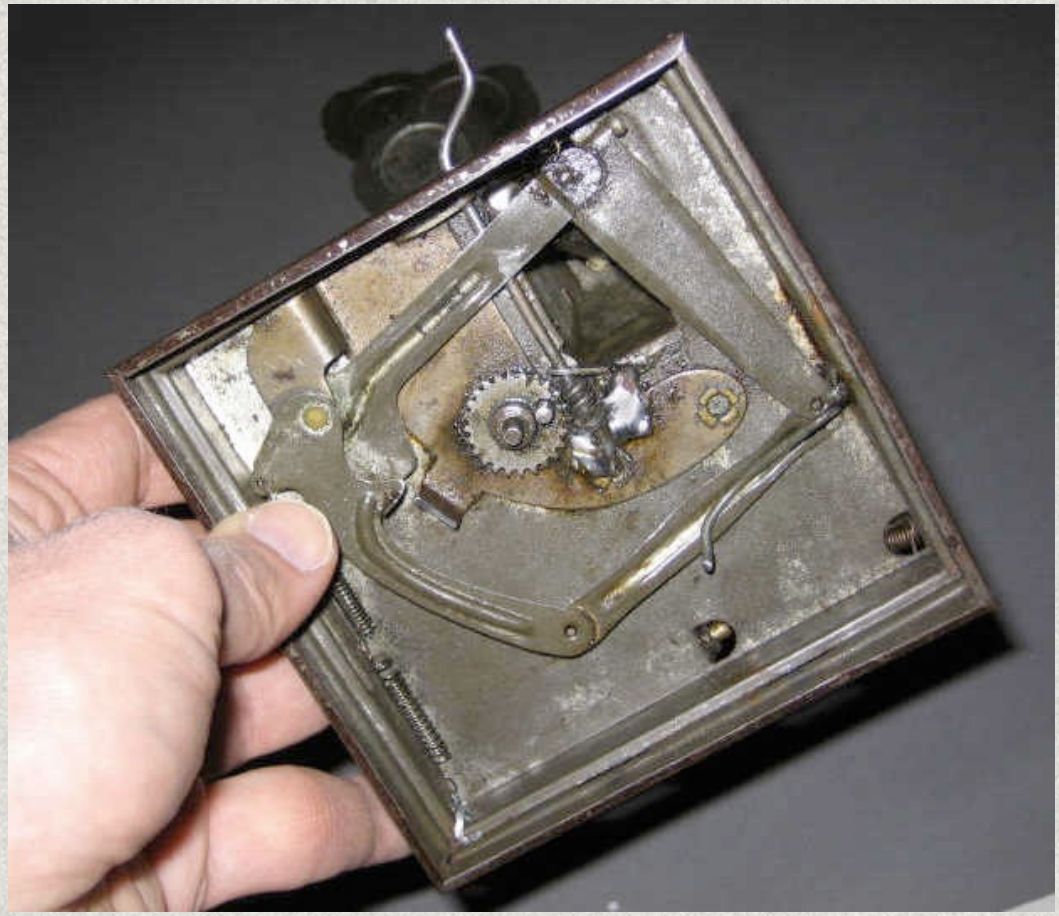




Jaquet-Droz Automata

1768-1774
The
Draughtsman

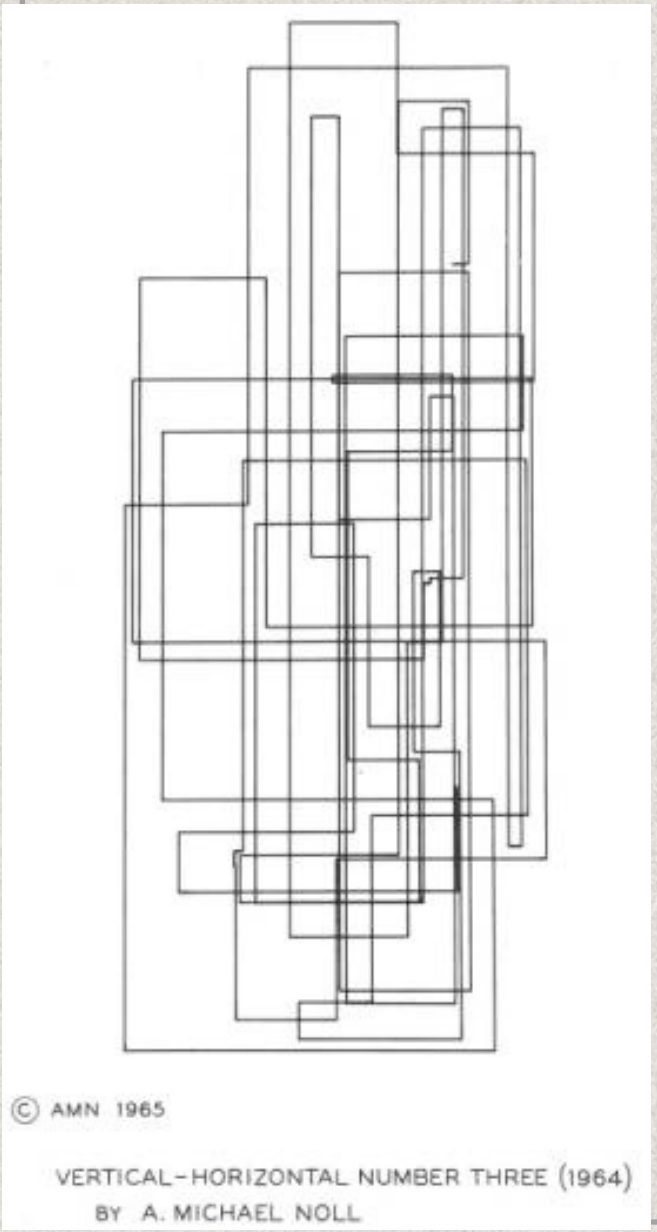
Cam-follower tin toy ~1895



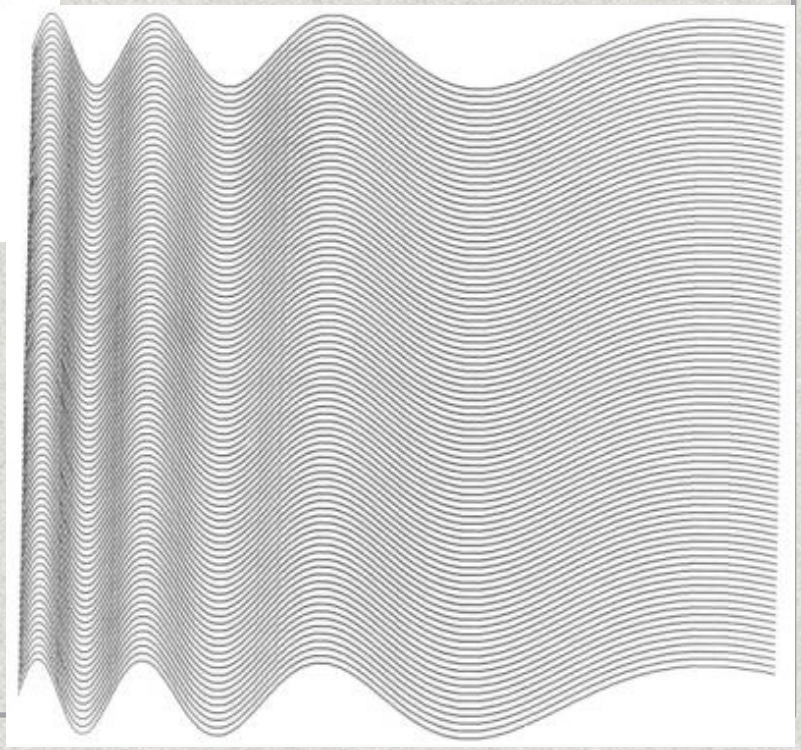
http://blog.dugnorth.com/2009/07/tin-clown-artist-picture-drawing.html

Cam-follower tin toy ~1895

A. Michael Noll, Bell Labs, ‘62–‘65

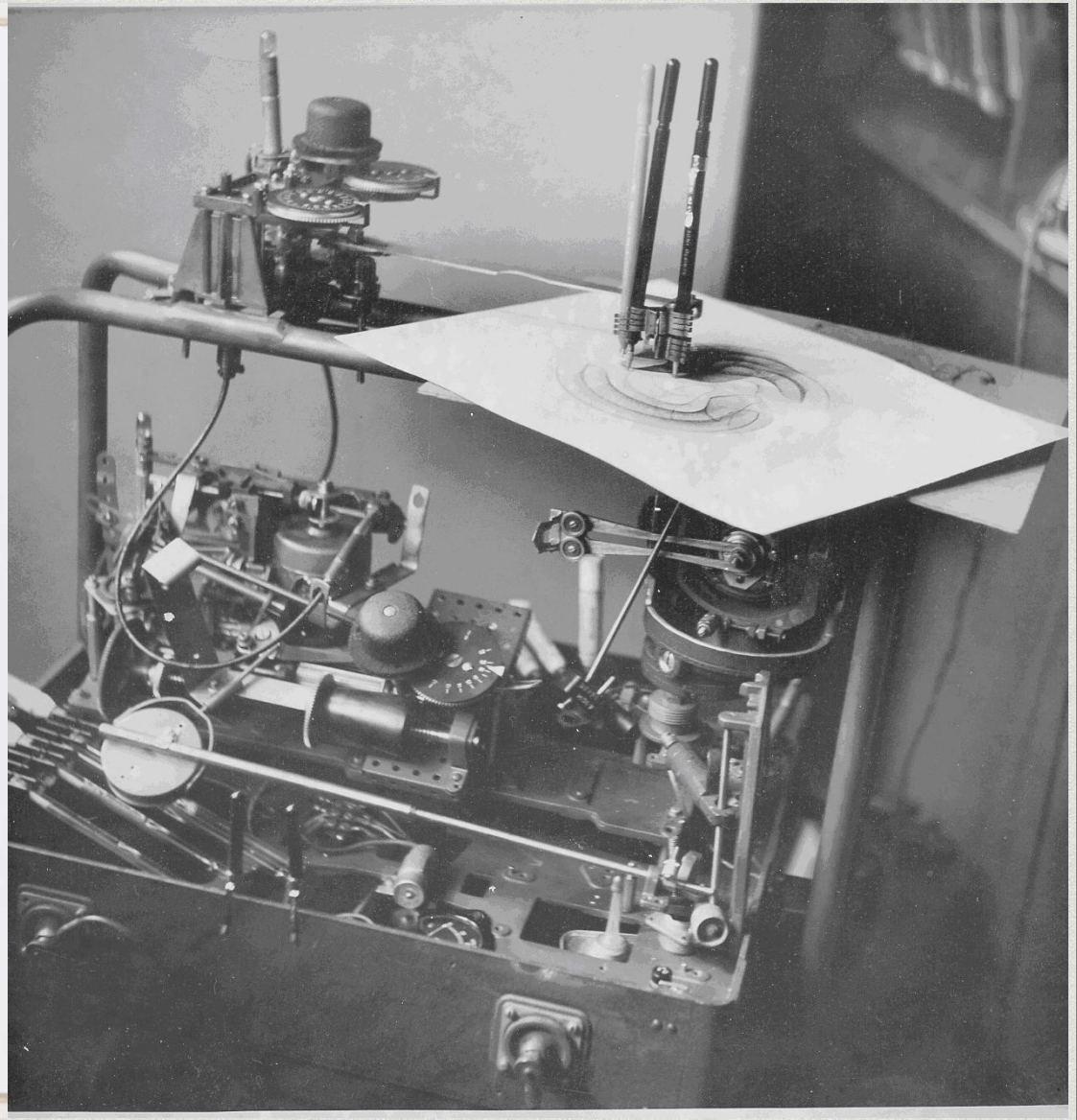


Stromberg-Carlson 4020 microfilm printer



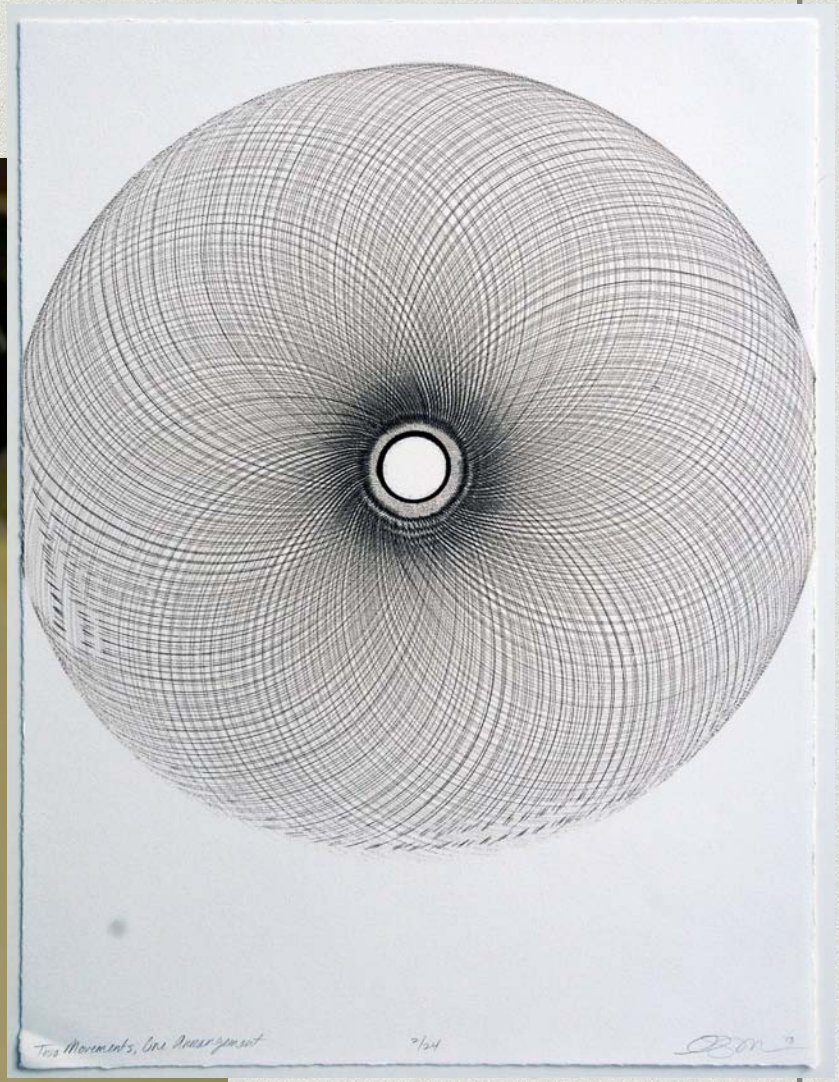
noll.uscannenberg.org

Desmond Paul Henry: 1962



http://www.desmondhenry.com/index.html

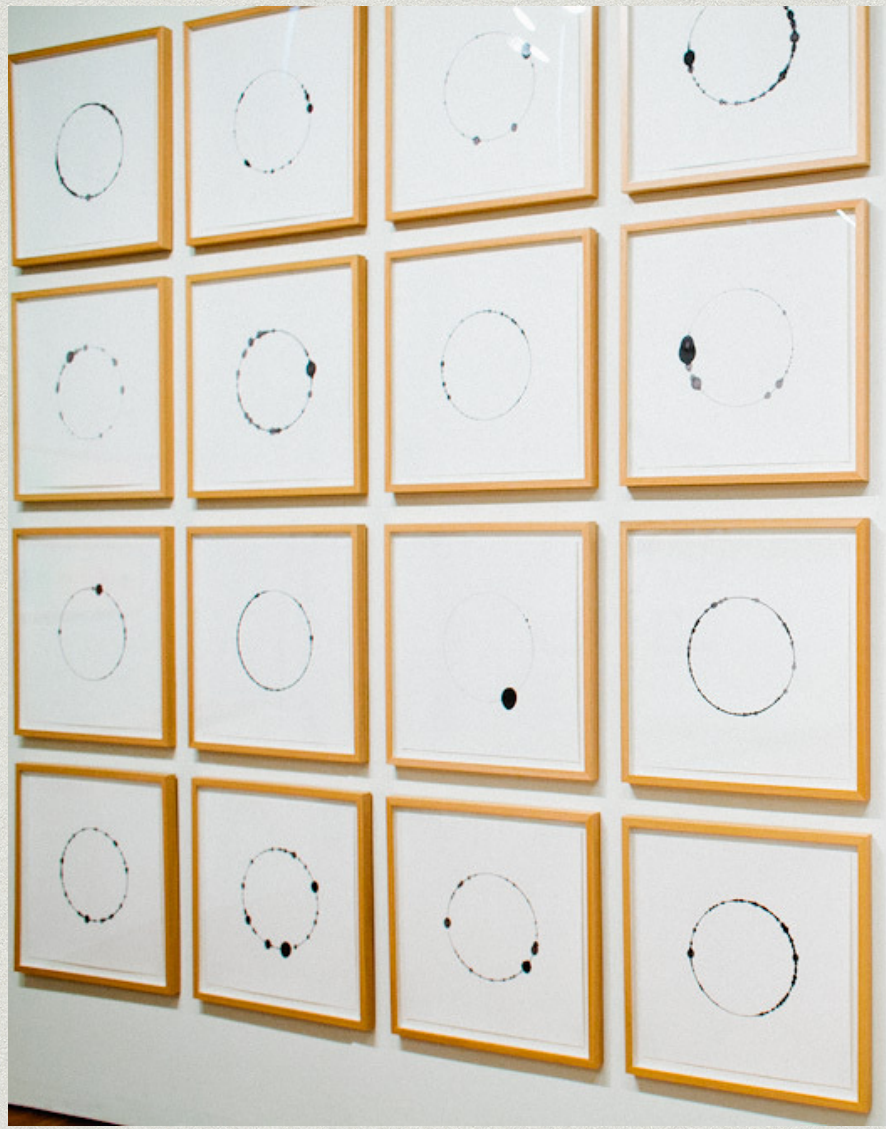
Leslie A. Grossman, 2012



Leslie A. Grossman, 2012

leslieagrossman.com/

Leslie A. Grossman, 2012

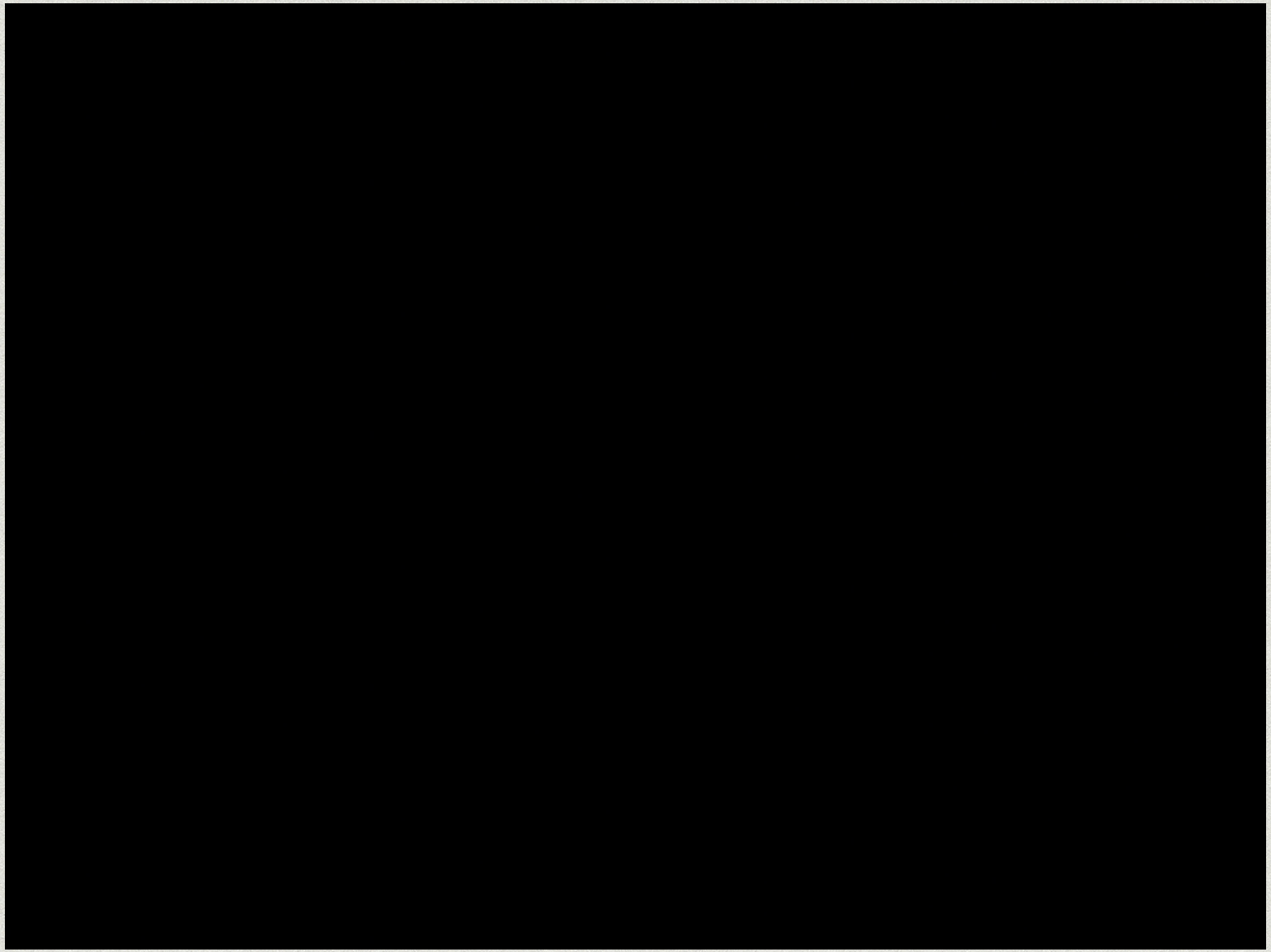


leslieagrossman.com/

Cameron Robbins, Australia

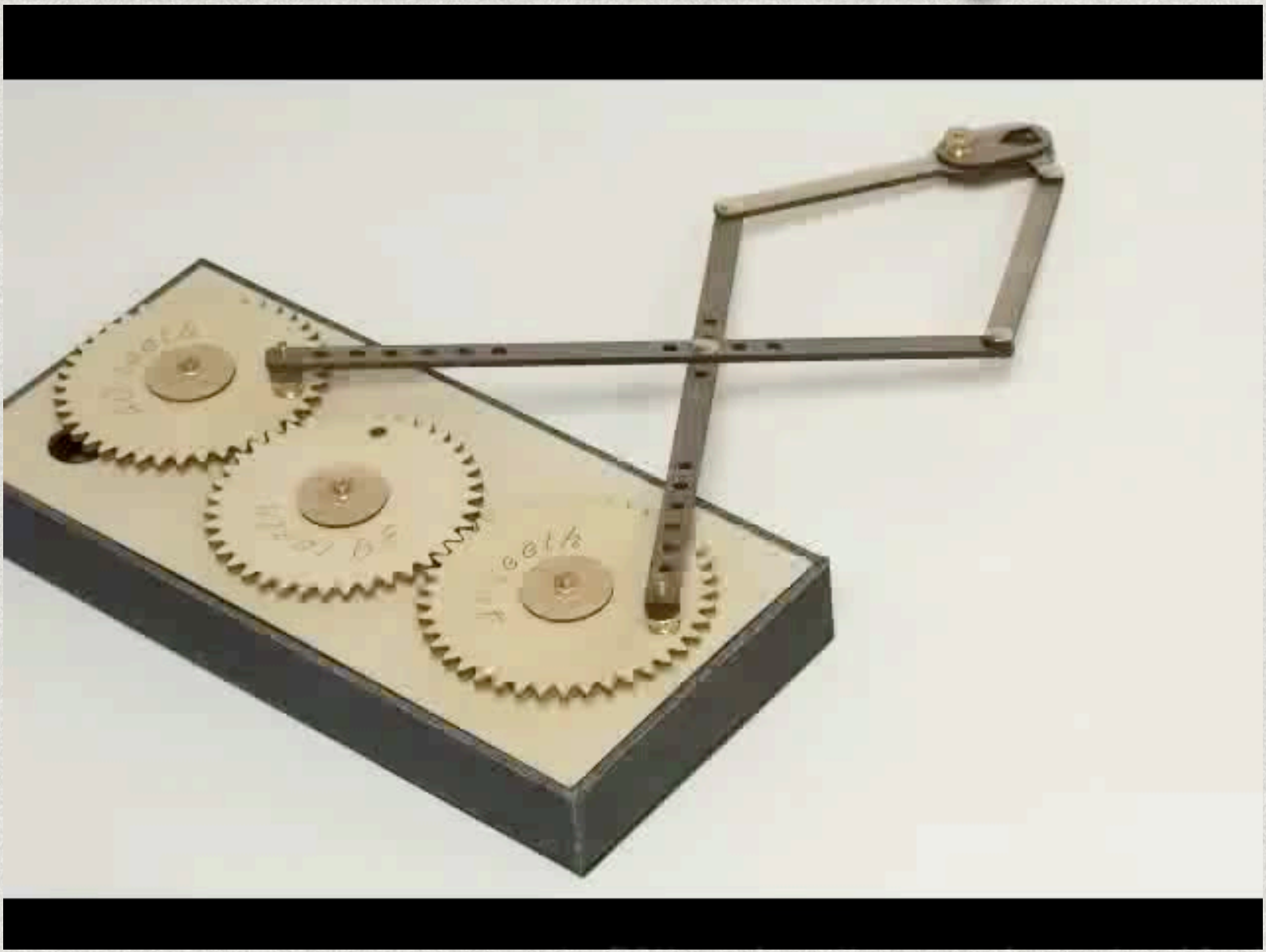
cameronrobbins.com/artwork/

David Bowen, U Minn, 2003



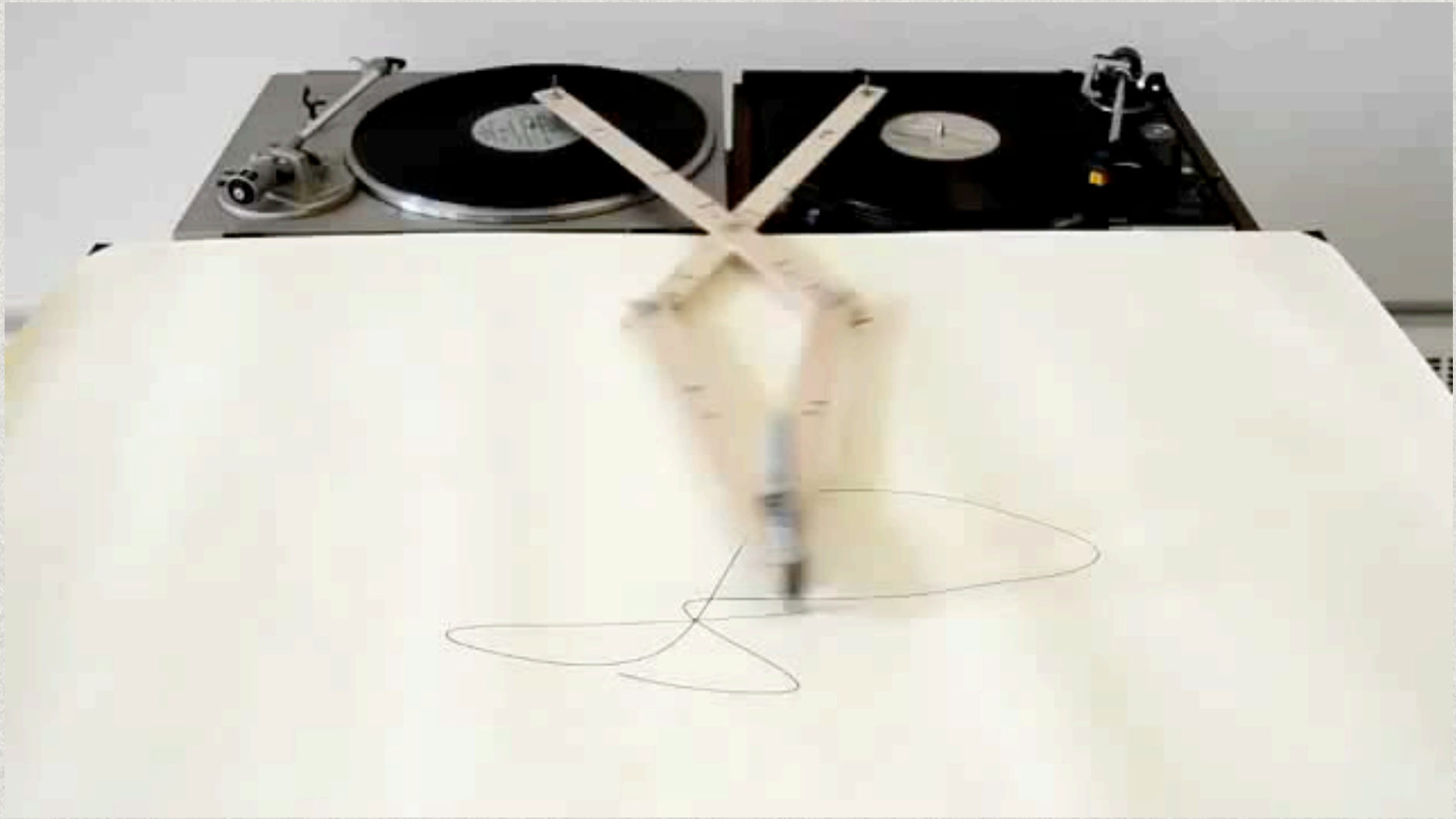
http://www.dwbowen.com/sonarmovie.html

Primograf



LeafPDX.com: https://www.youtube.com/watch?v=4pEqbs0ISaw

Robert Howsare

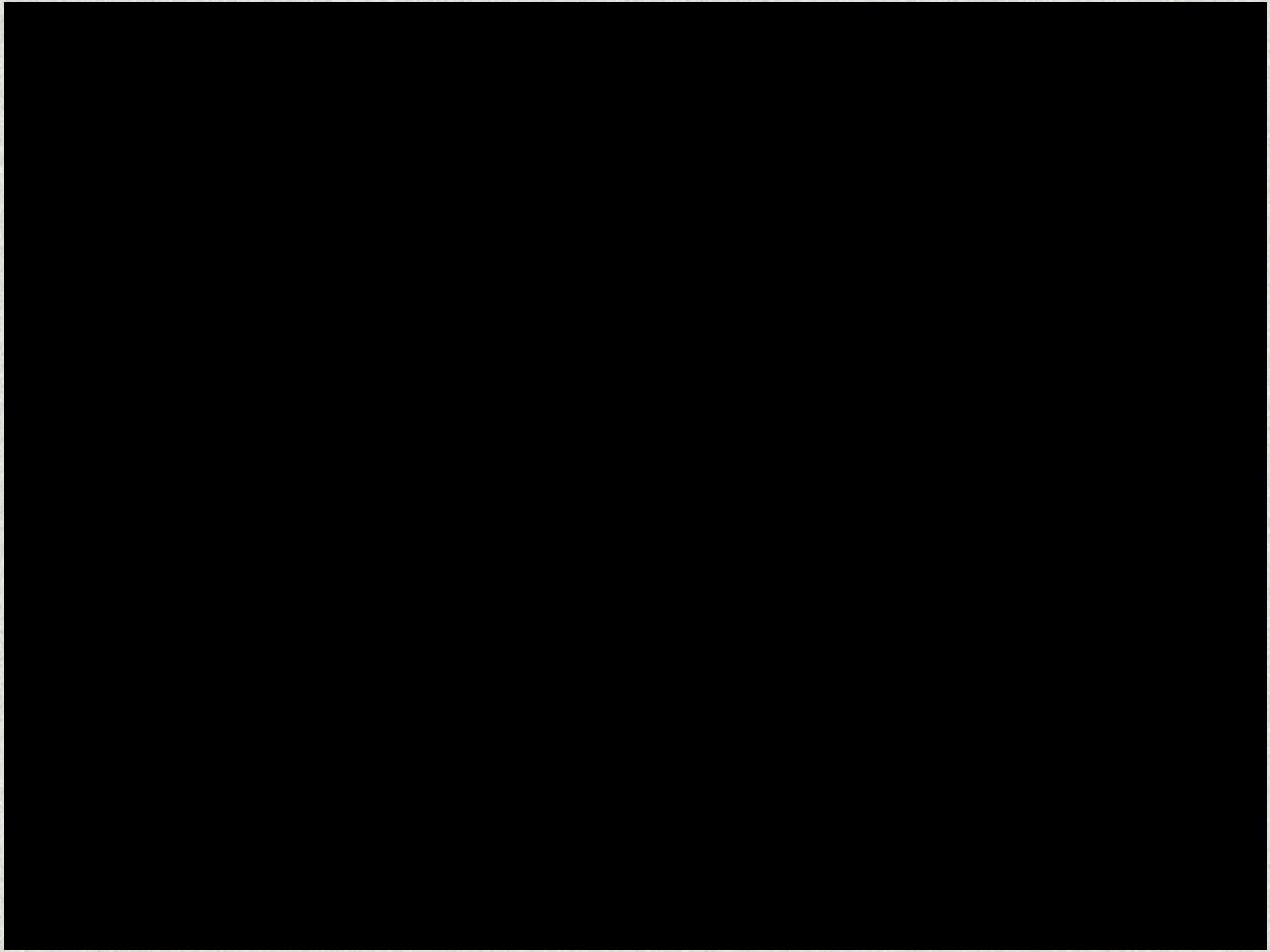


https://www.youtube.com/watch?v=EB_oSgx5b3I

Harmonograph

Wayne Schmidt: https://www.youtube.com/watch?v=HJYvc-ISrf8

Alfred Hoehn



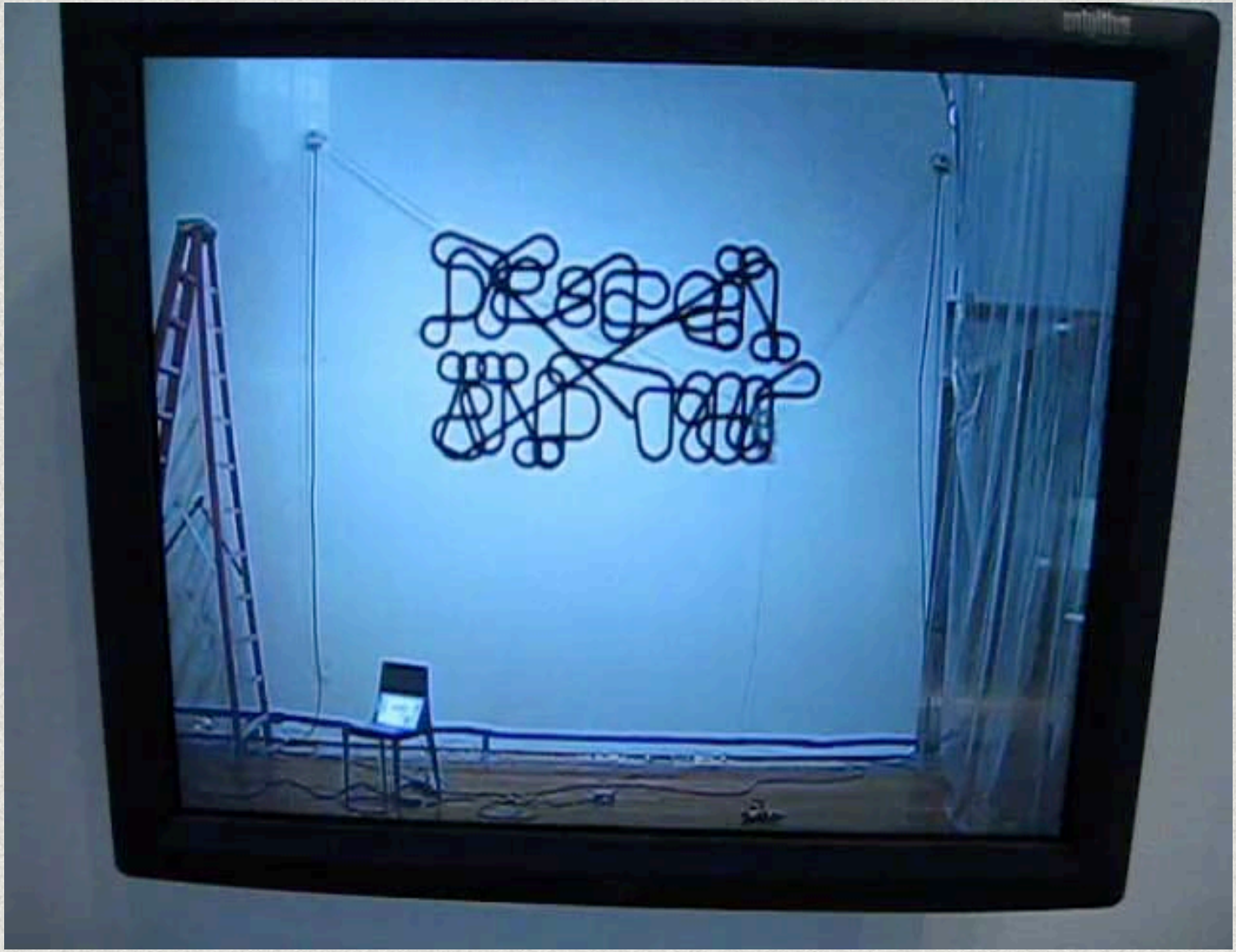
http://www.alfredhoehn.ch/

Patrick Tresset: Paul the Drawing Robot

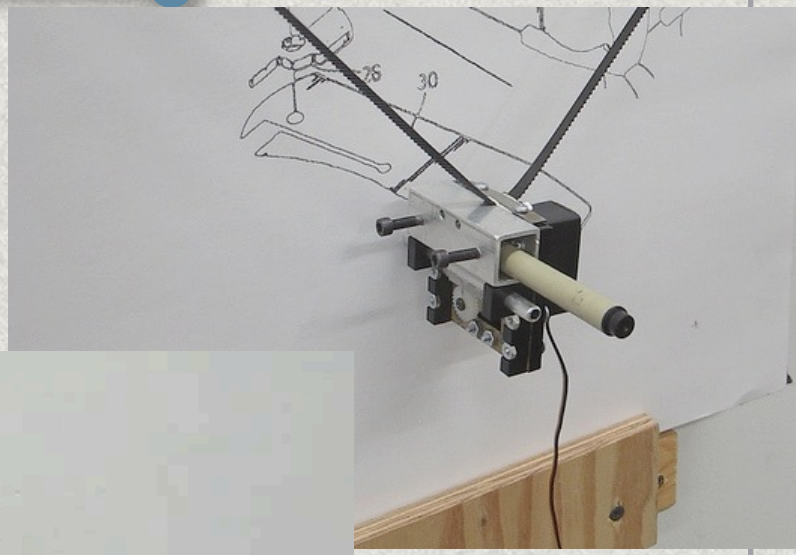
http://doc.gold.ac.uk/~ma701pt/patricktresset/

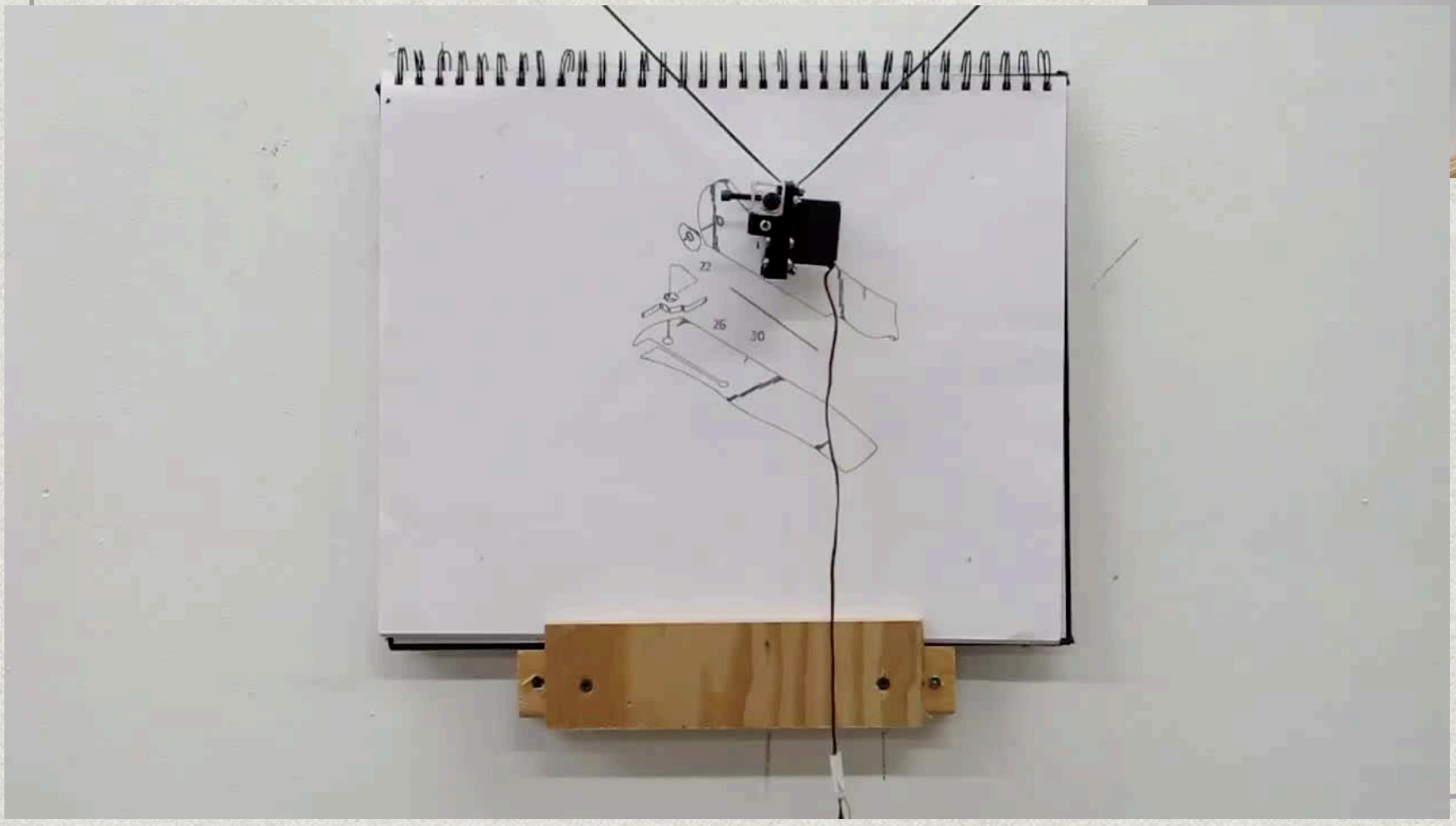
Hektor - 2002

Uli Franke, Jürg Lehni



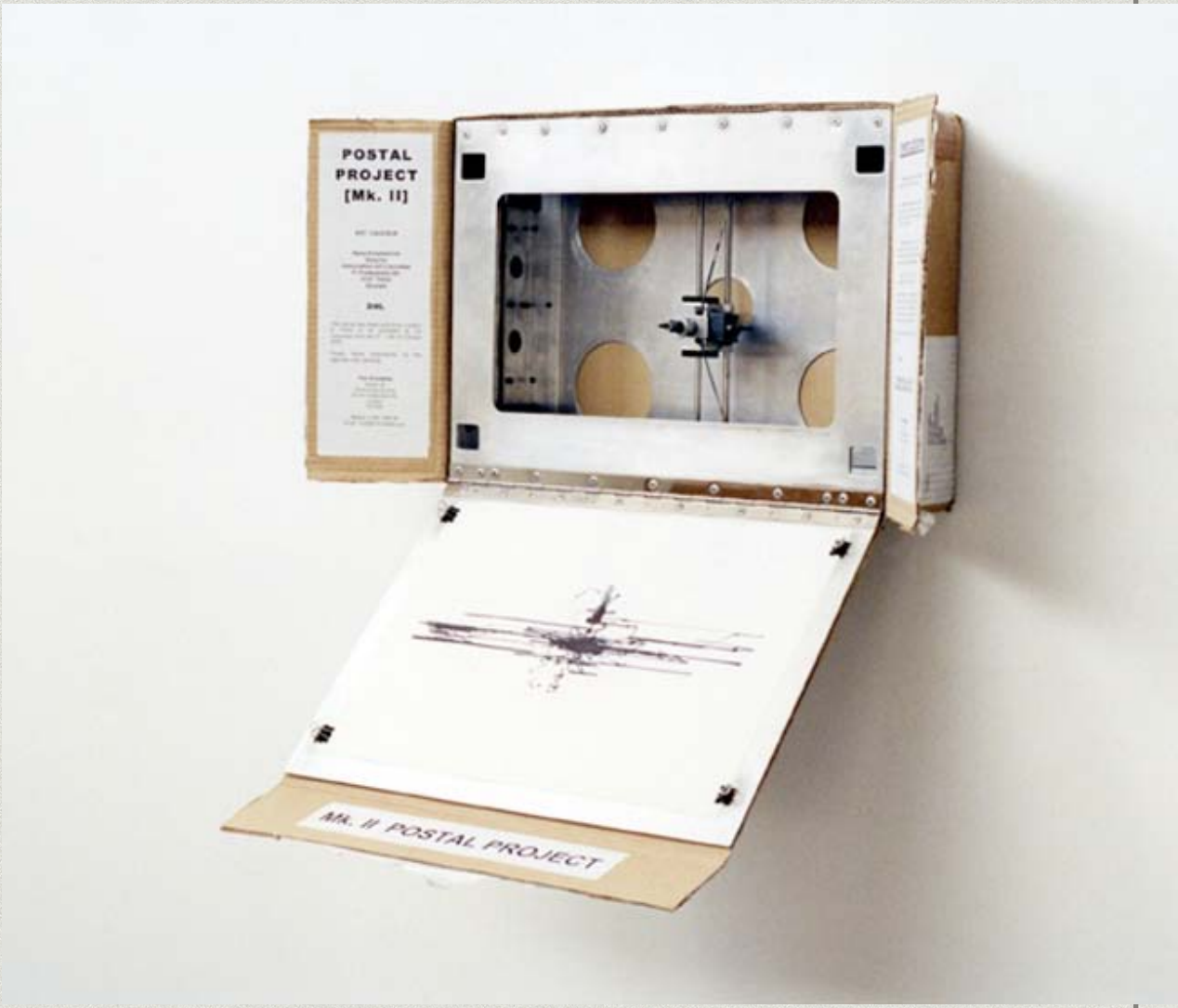
Robert Twomey, 2013





Example High School Curriculum

- Based on the *Postal Project* by Tim Knowles
  - Katie Campbell
    Alta High School
    Salt Lake City, UT



Example High School Curriculum

- Objectives:
  - Each student is given a postal box
  - Each student chooses a drawing medium
  - Each student puts drawing paper as well as their drawing medium inside the postal box
  - Each student seals the postal box
  - Each student is required to carry the postal box for a period of one day, from sun up to sun down, without opening the box

Katie Campbell, Alta High School, Salt Lake City, UT

Example High School Curriculum

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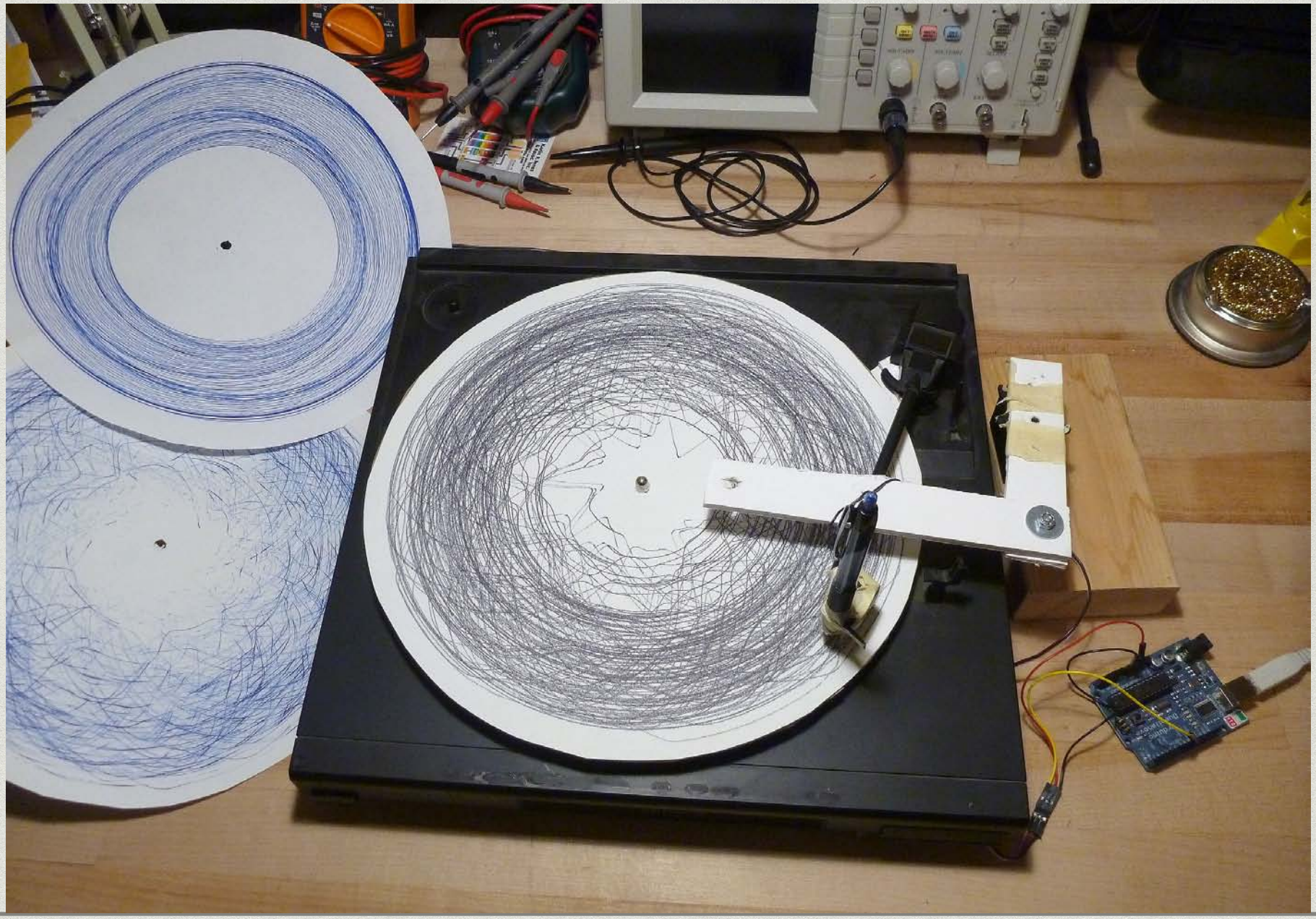
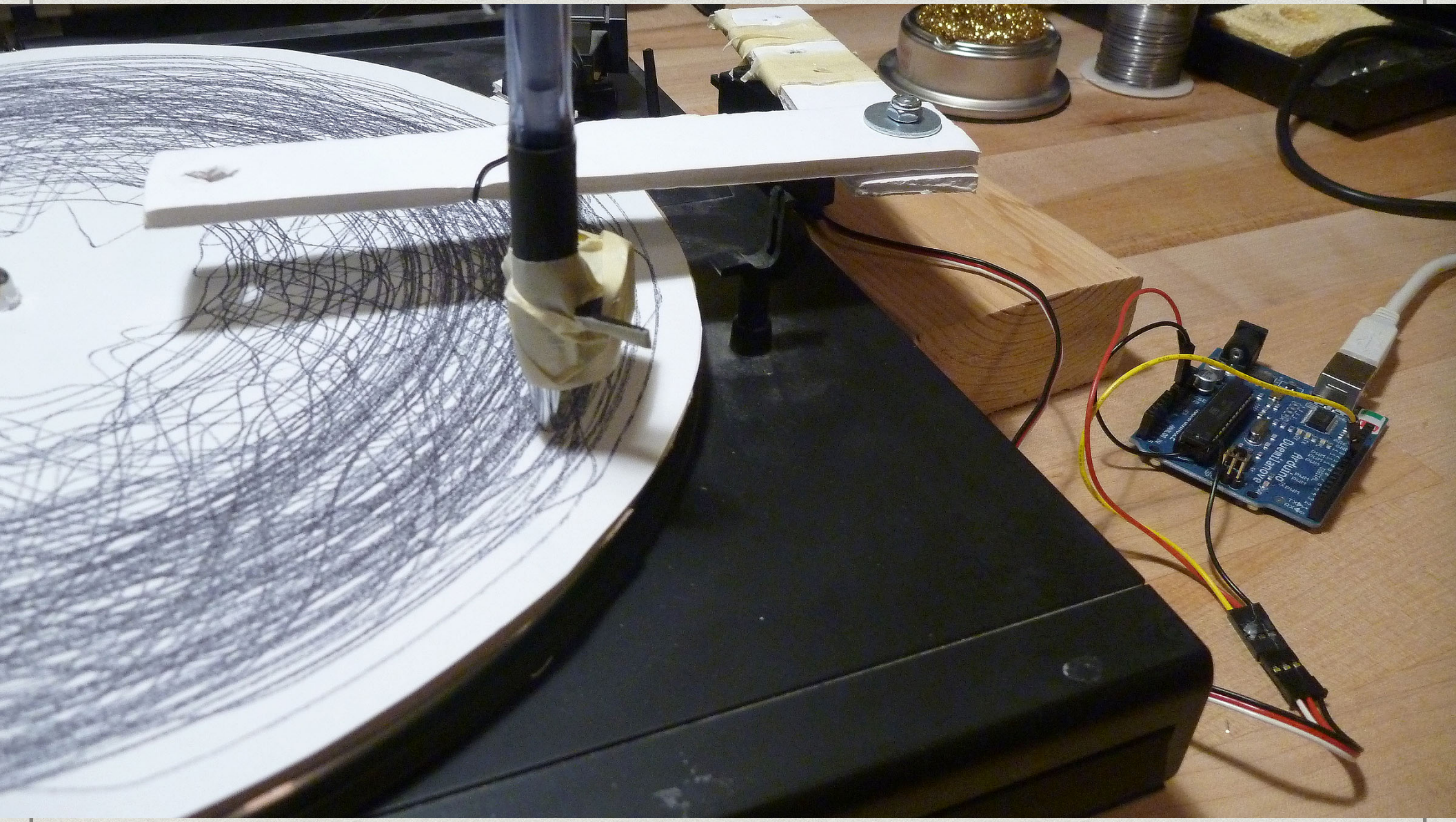
Drawing Machines (Erik Brunvand 2014)

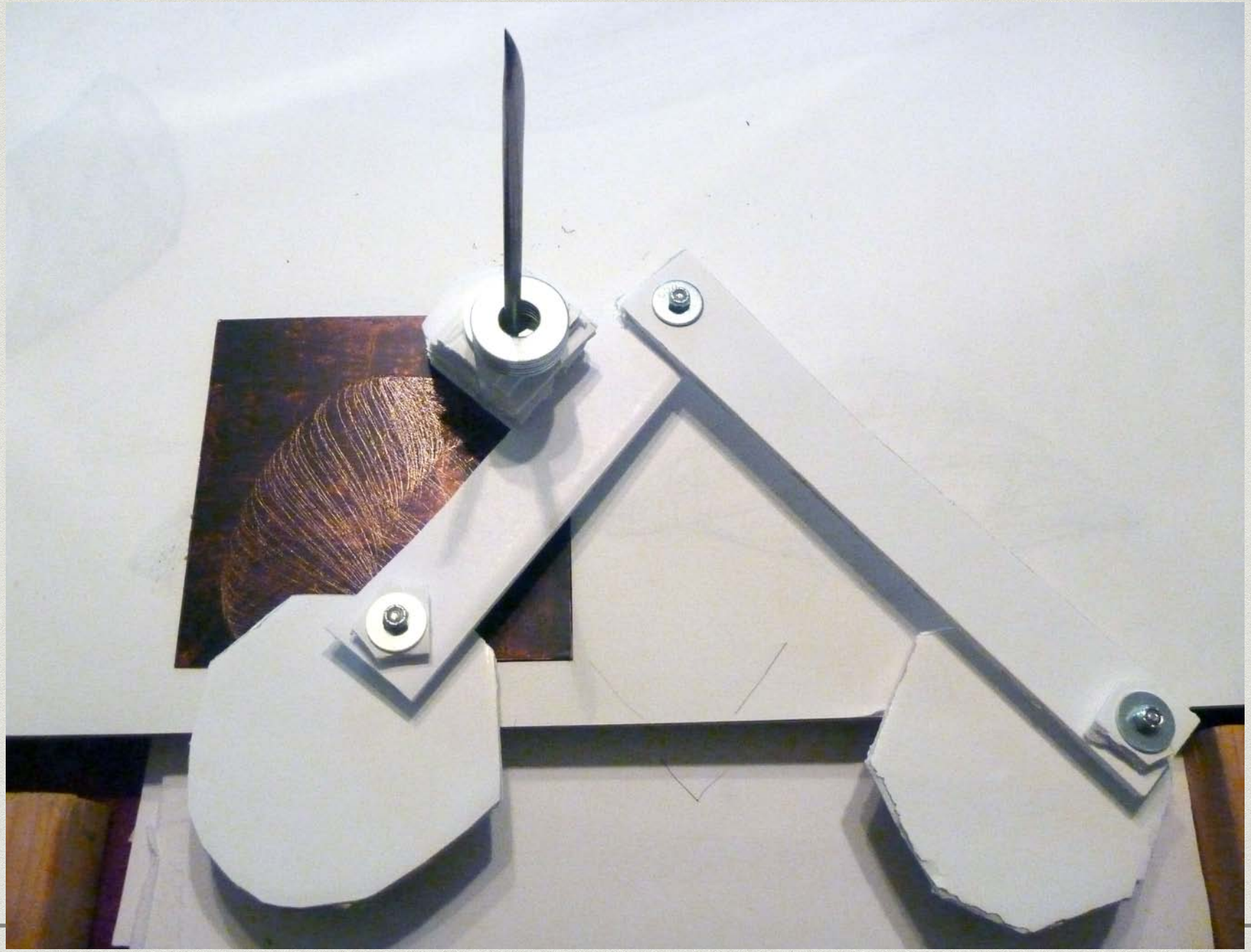


Drawing Machines (Erik Brunvand 2014)

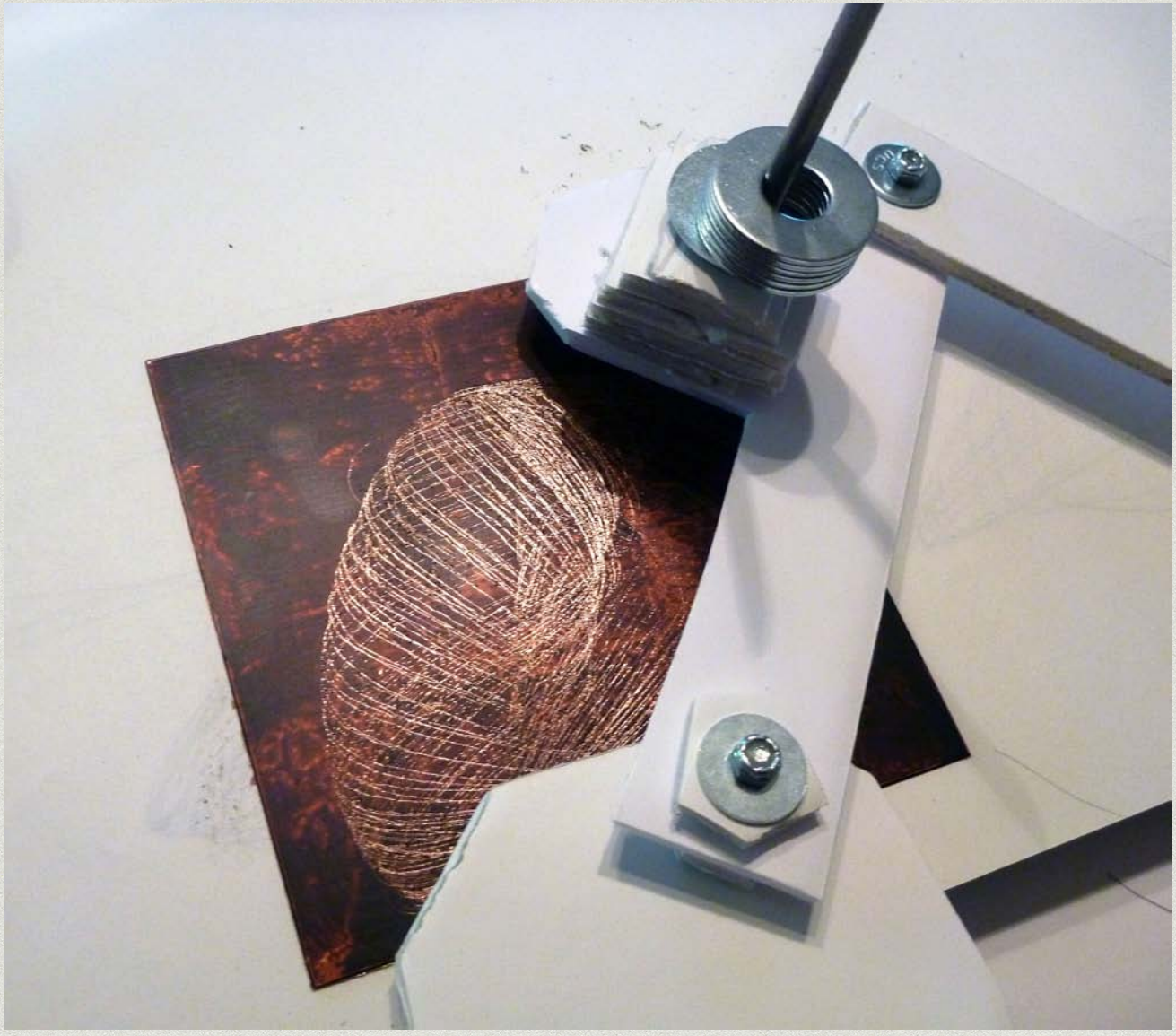


Distortion (Erik Brunvand 2014)

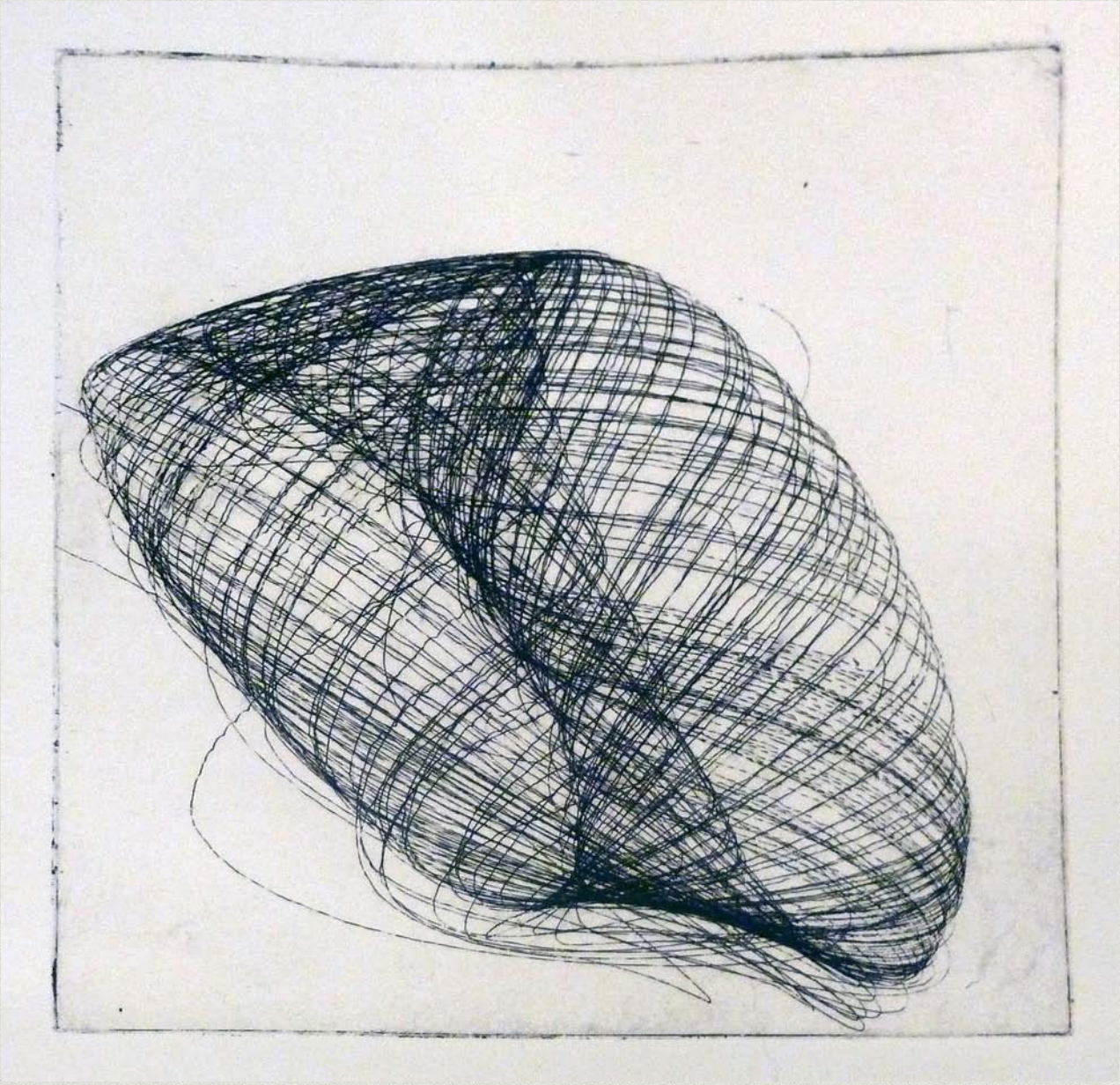
Etching Machine (Erik Brunvand 2014)



Etching Machine (Erik Brunvand 2014)



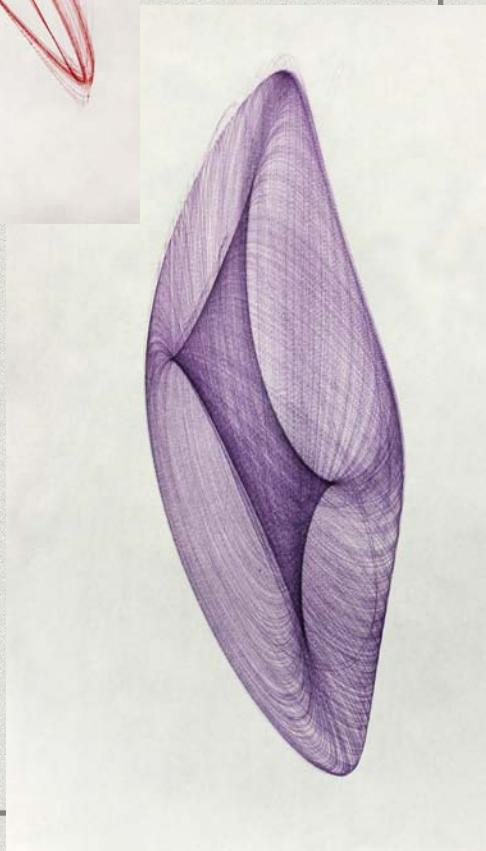
Etching Machine (Erik Brunvand 2014)



Conclusions (of history/overview)

Drawing Machines are an intriguing way to combine art and engineering

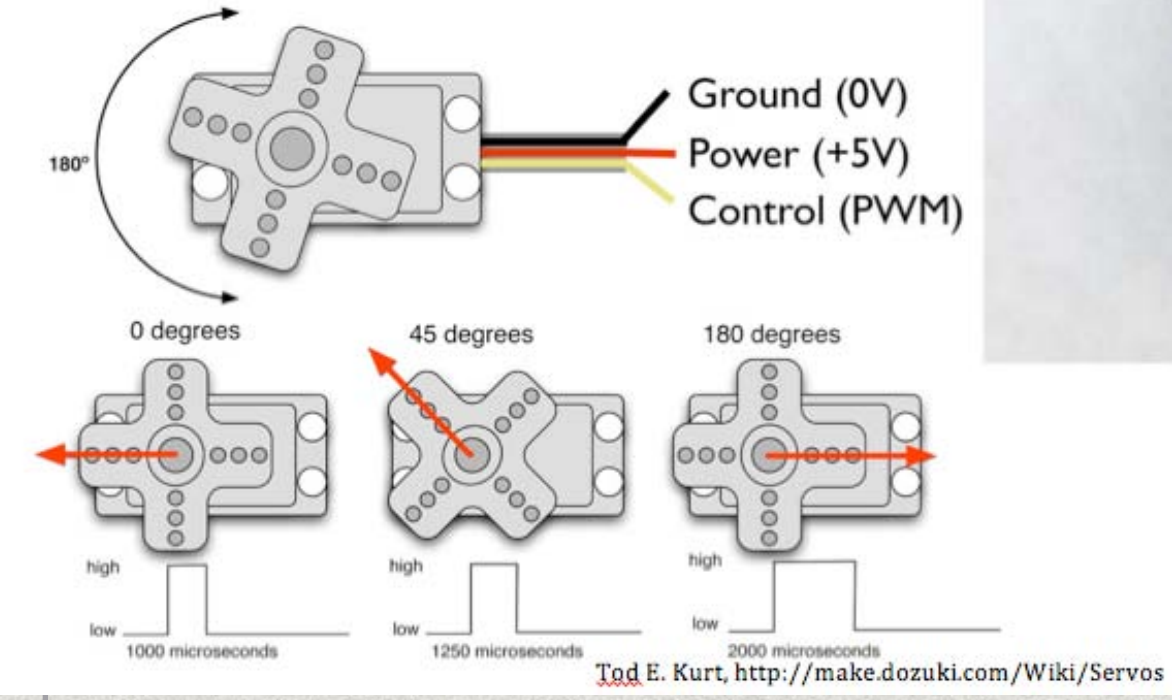
- Long and interesting history
- Fascinating kinetic sculptures
- Potential for collaboration
  - *Art students are introduced to engineering*
  - *Engineering students are introduced to art*



Workshop Project

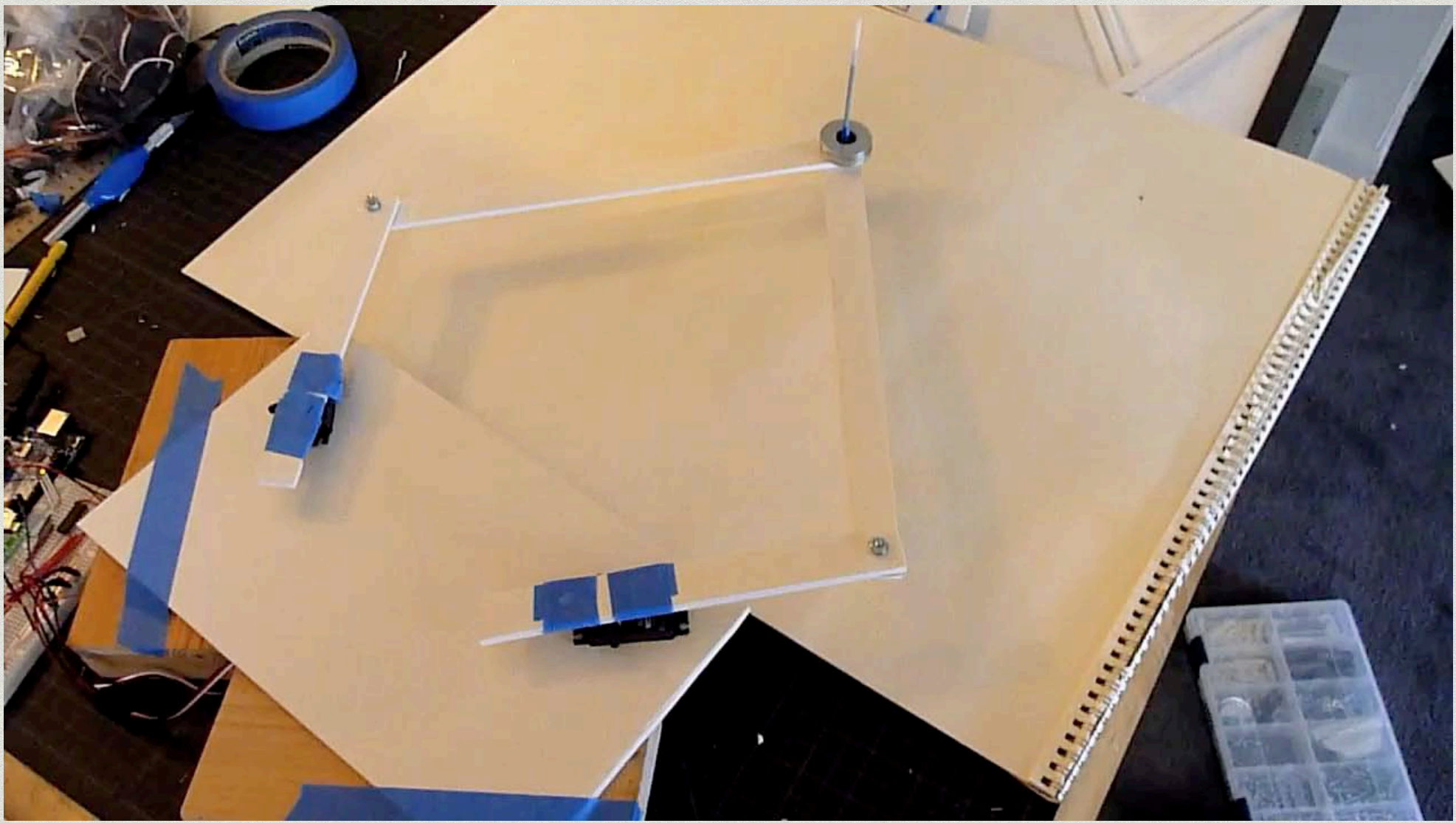
- A couple specific drawing machines that are easily prototyped
  - Computer control with Arduino
  - Introduces computing in an arts context
  - Introduces art in a computing context
  - Great for interdisciplinary groups
- Details…
  http://www.cs.utah.edu/~elb

Hobby Servos

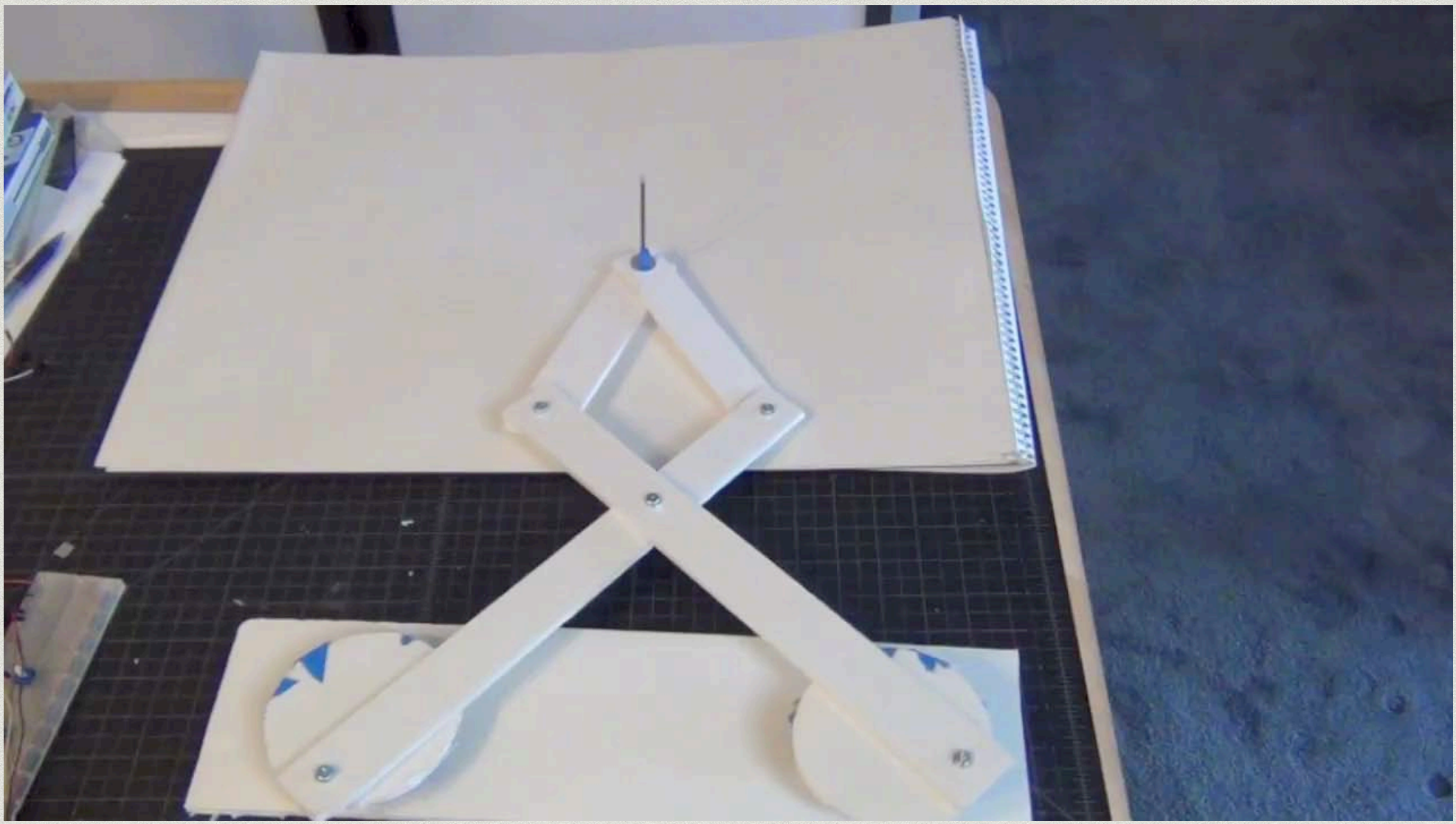


Tod E. Kurt, http://make.dozuki.com/Wiki/Servos

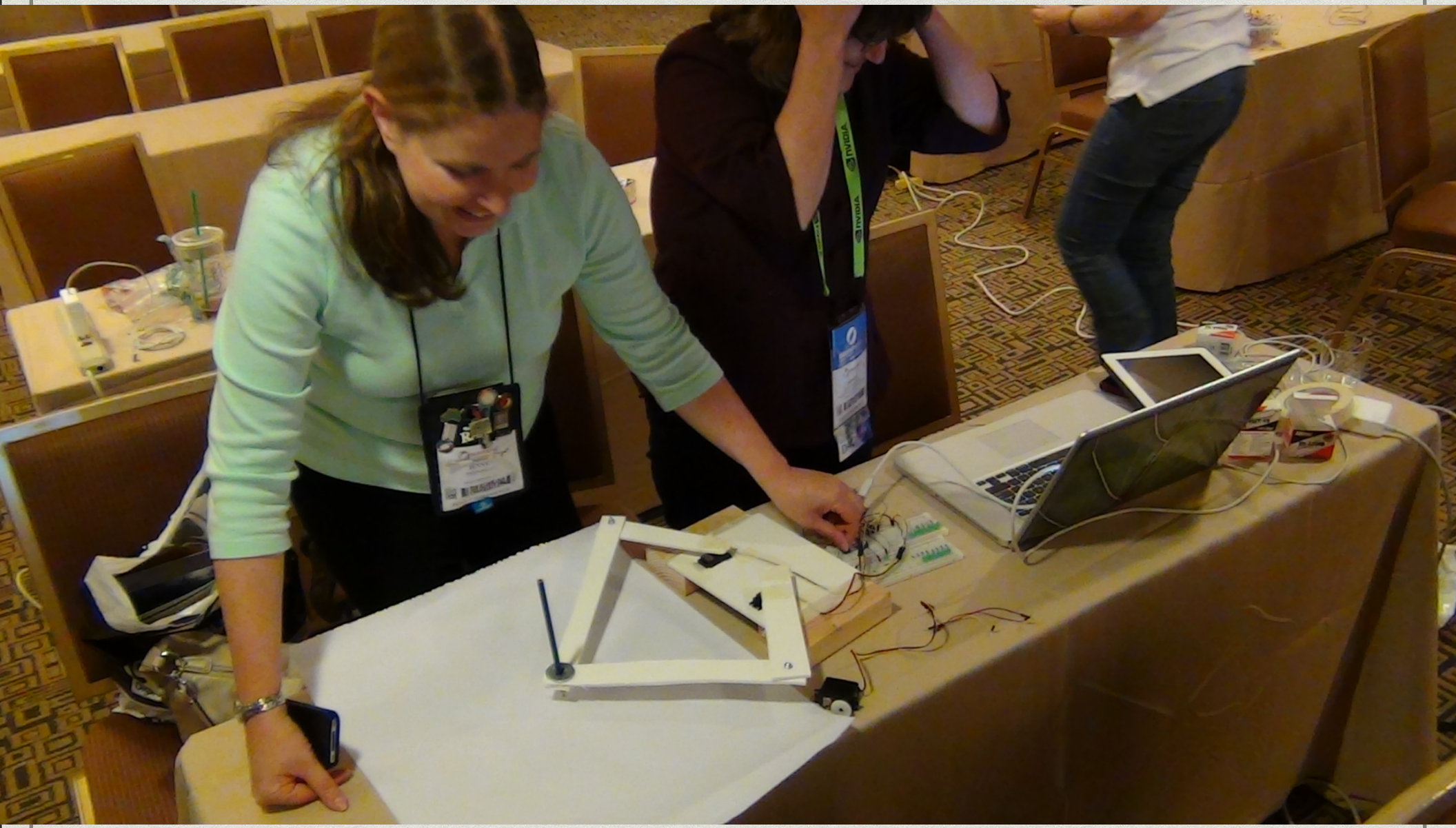
The Dancing Arms Drawing Machine

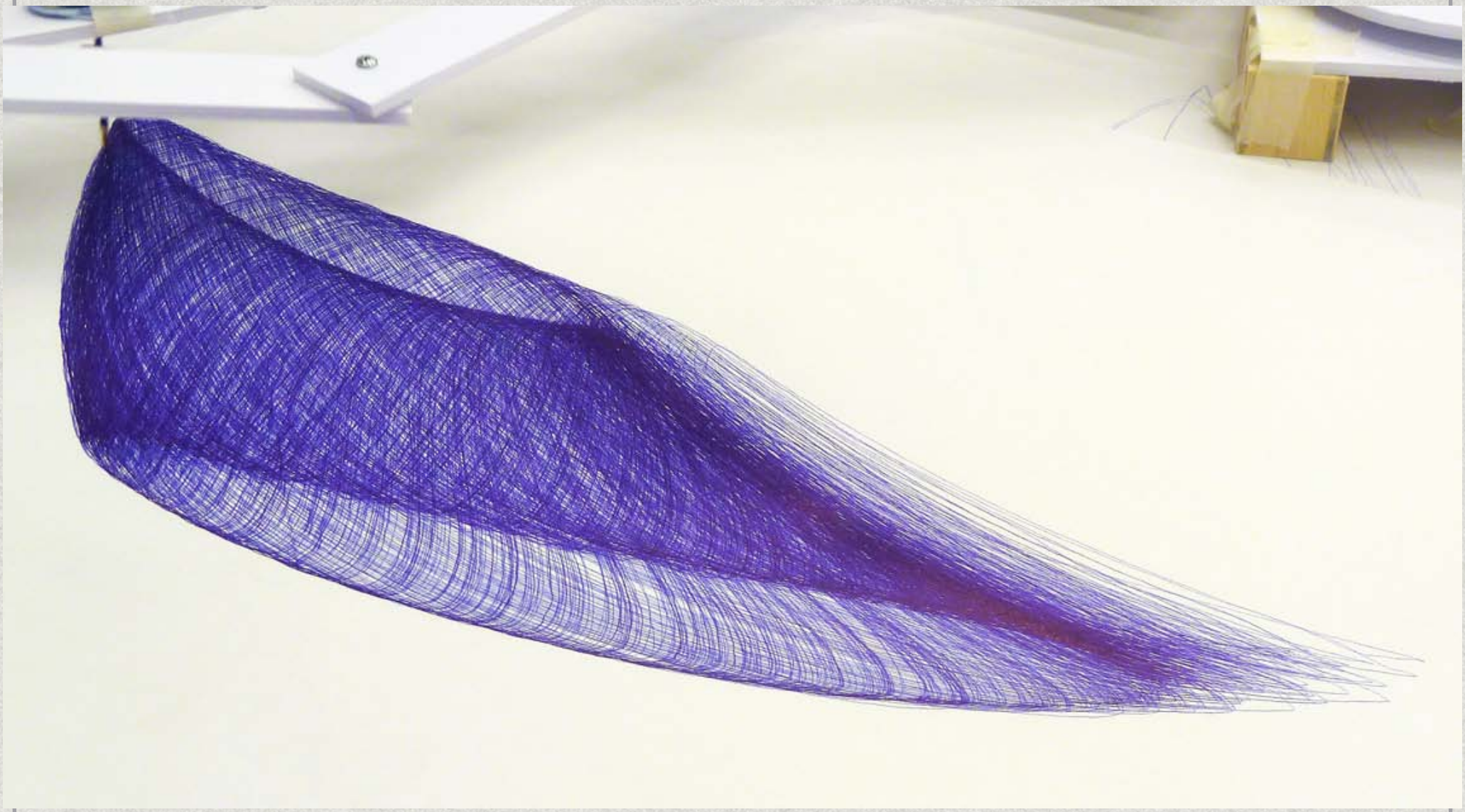


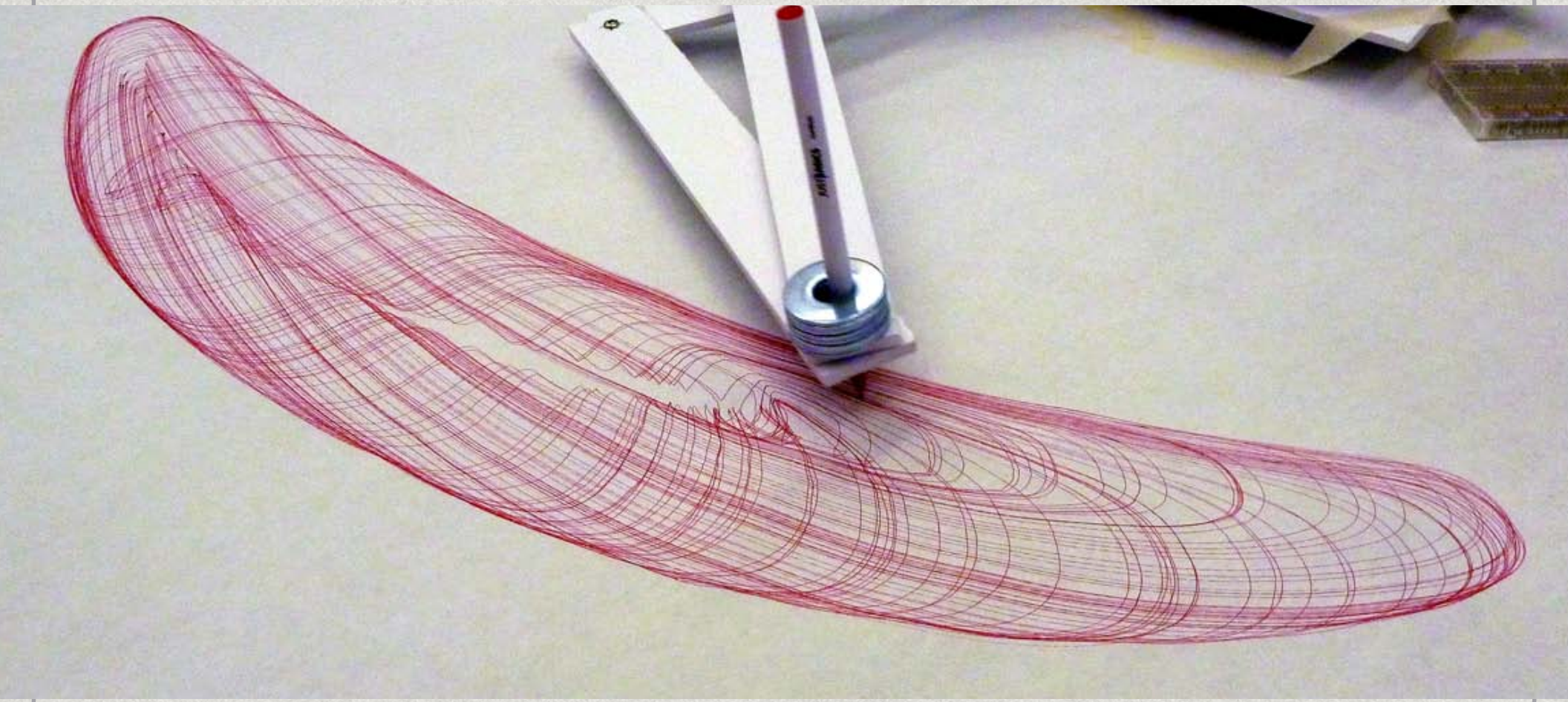
The Harmonograph

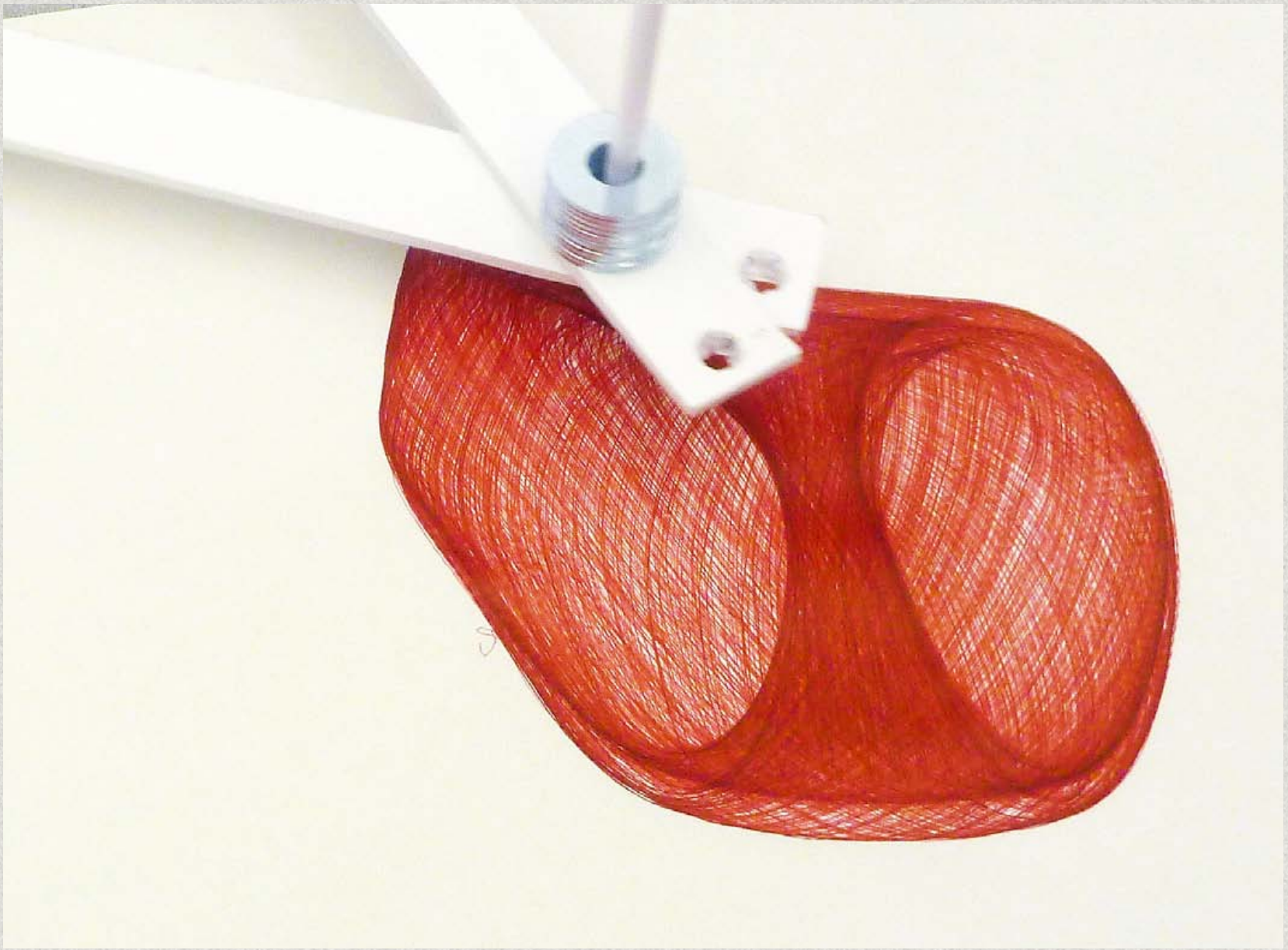


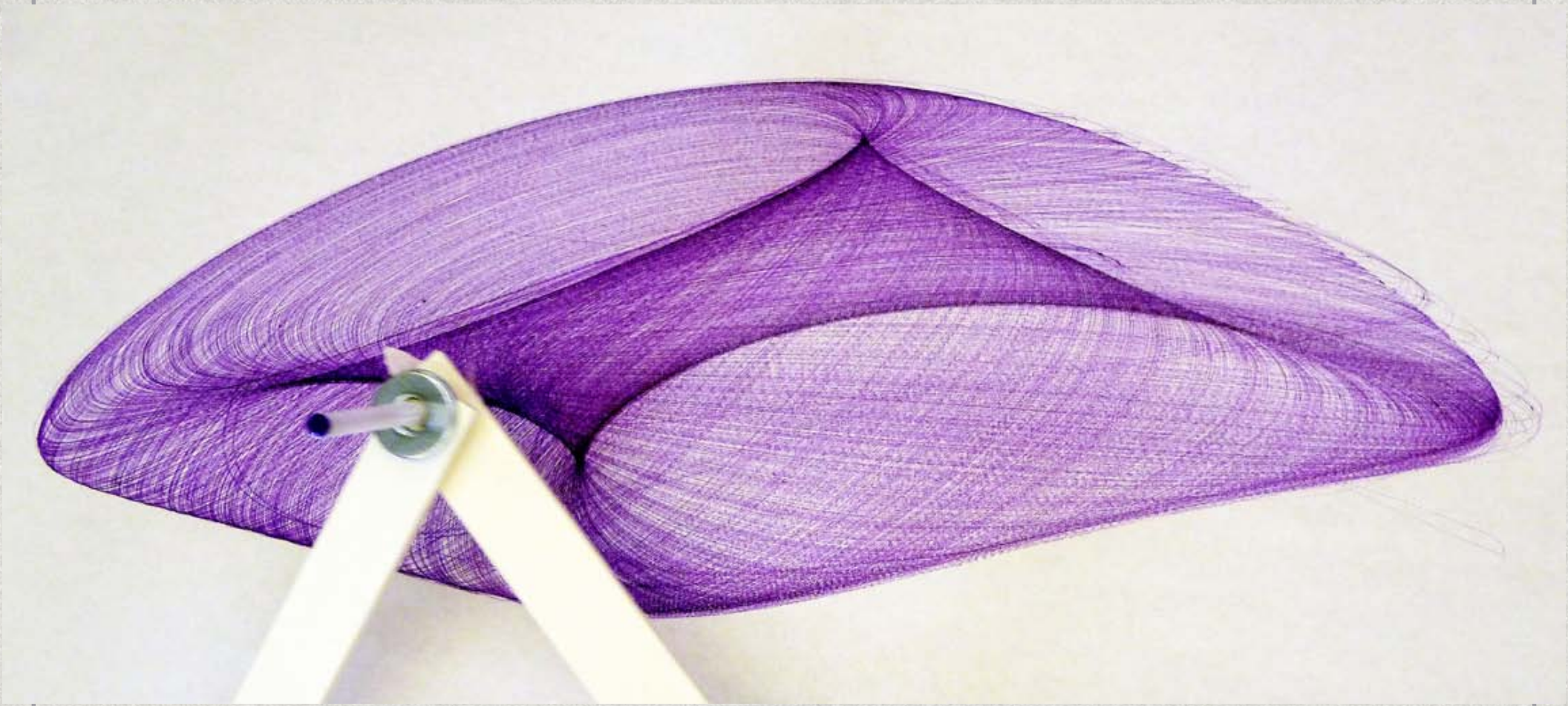
From an Educator Workshop









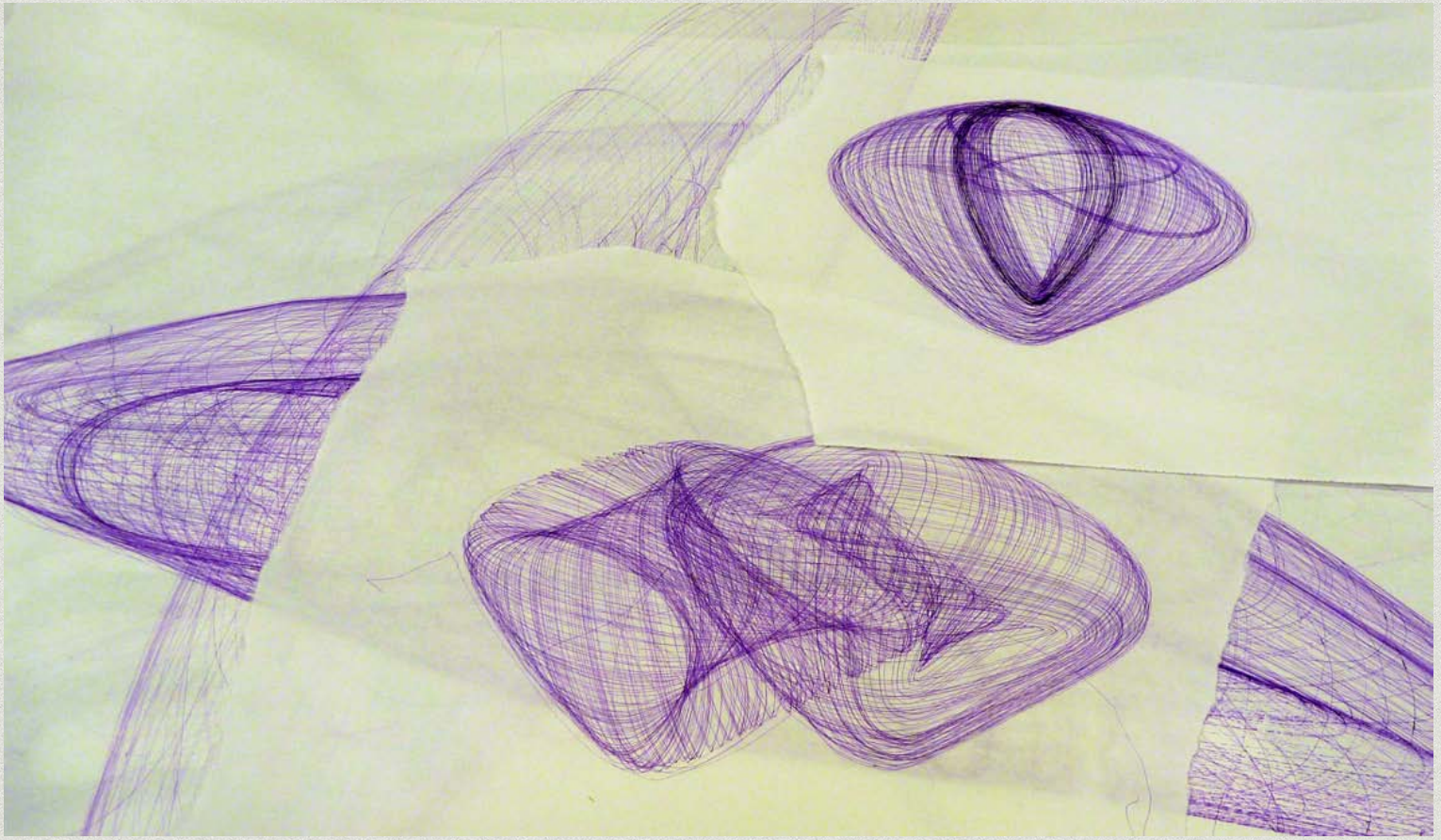


Workshop

- Have fun!
- Build cool machines!
  - Long duration drawings are often much cooler than short-time drawings

Contact / Handouts

- Erik Brunvand - ebrunvand@hotmail.com
- Handouts/slides - http://www.cs.utah.edu/~elb



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