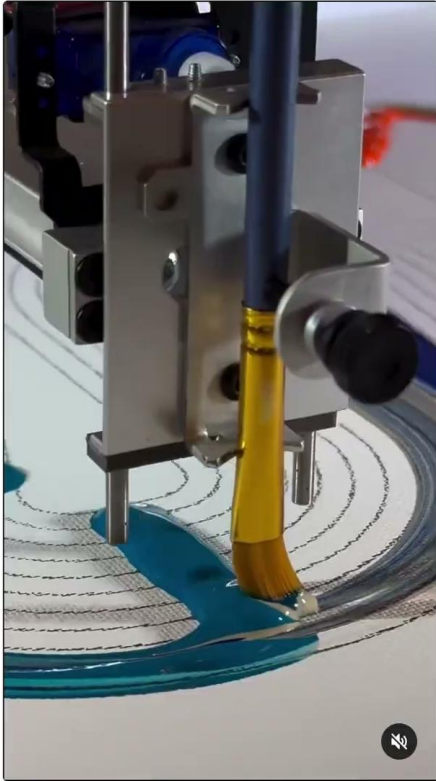
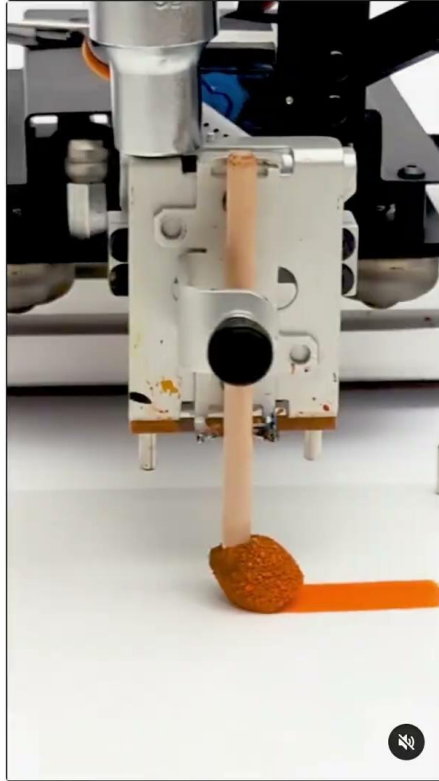




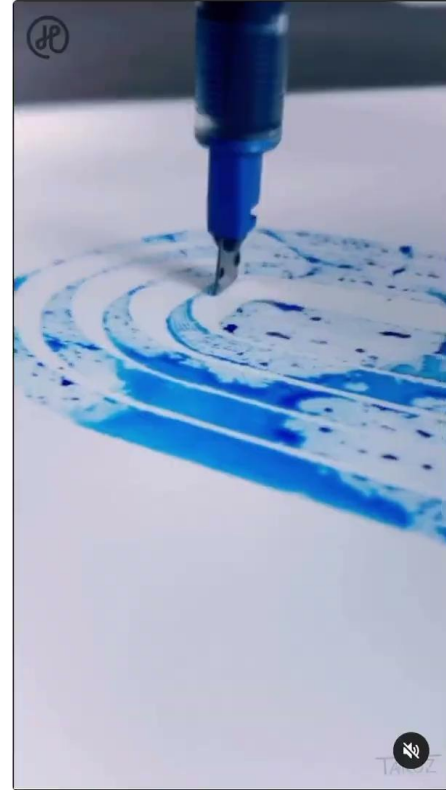
Robots\_2stClass\_Complex\_Drawing



<https://www.instagram.com/reel/C3Go-iOPtdg/>

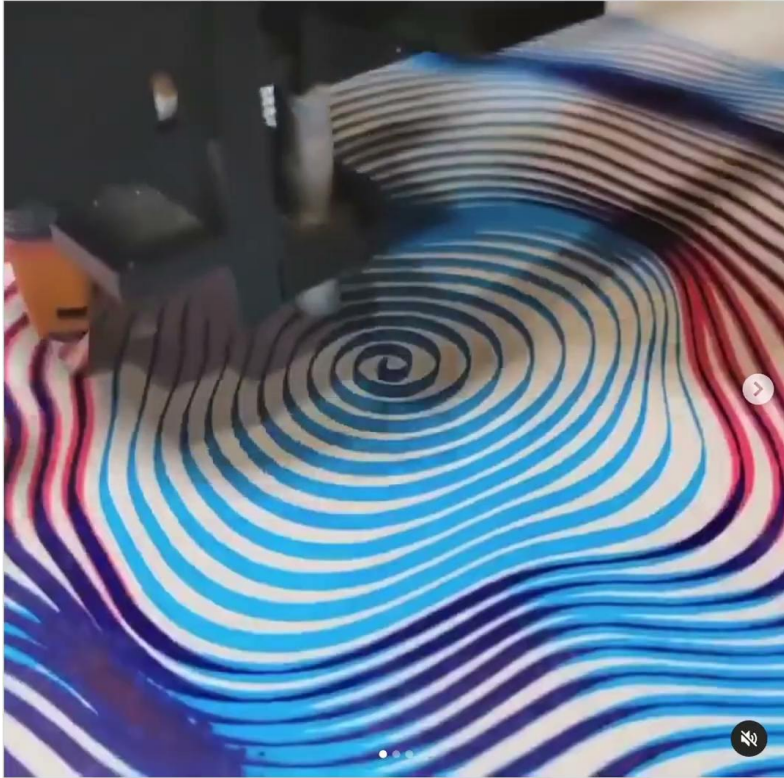


<https://www.instagram.com/p/CwdUBlEsnyE/>



[https://www.instagram.com/reel/CpyOjz\\_DjjD/](https://www.instagram.com/reel/CpyOjz_DjjD/)

Stroke design control - through material, code and end effector.



<https://www.instagram.com/p/CZnDlnpvlNx/>



[https://www.instagram.com/p/CV\\_LDM9hki4/](https://www.instagram.com/p/CV_LDM9hki4/)

Stroke design control - Pilot Parallel Pen: Varying Line Width With Just One Pen



<https://www.instagram.com/reel/C5J2CnFy6MV/>



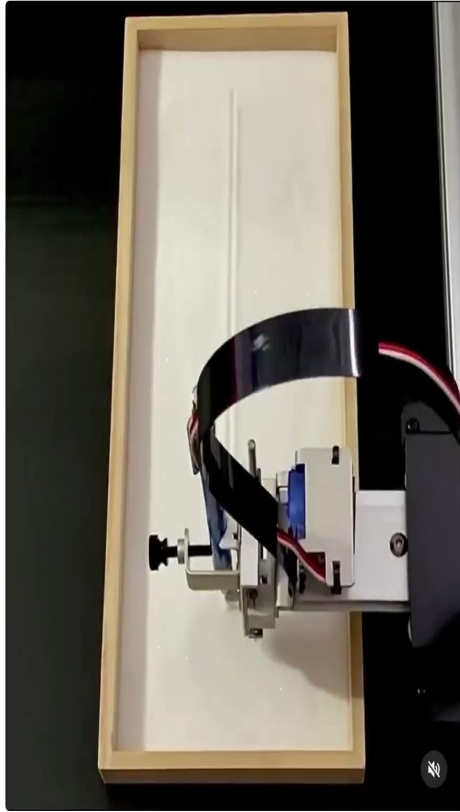
<https://www.instagram.com/reel/C3vZ7hUvM5a/>



<https://www.instagram.com/reel/CthkHoH1xg4/>

Different material and tools





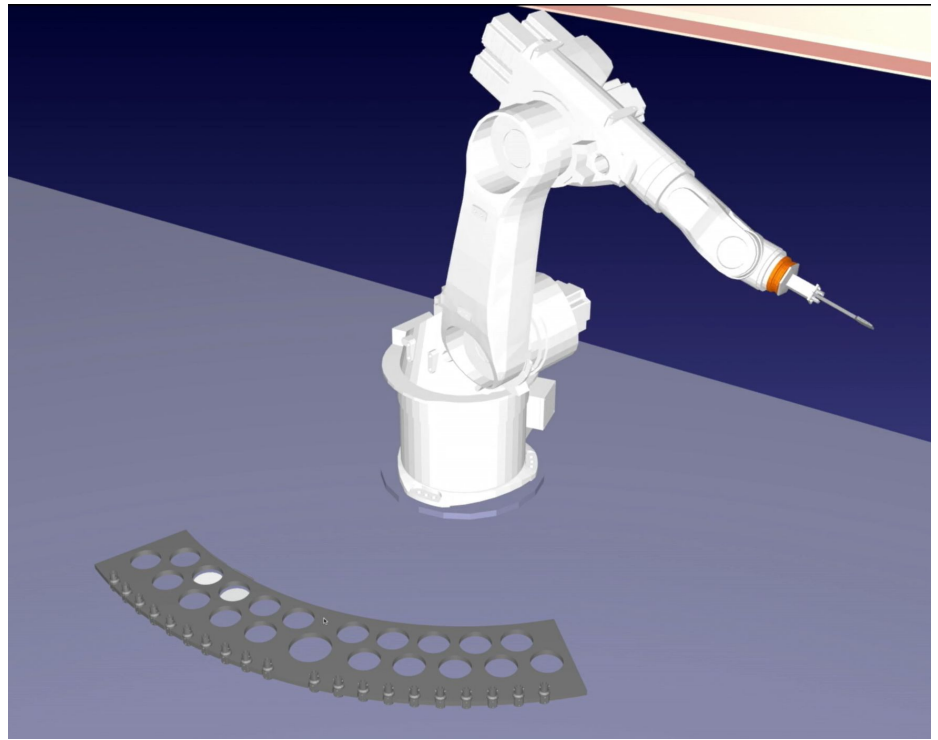
<https://www.instagram.com/reel/CSzajhCJzcE/>



<https://gramaziokohler.arch.ethz.ch/web/e/lehre/211.html>



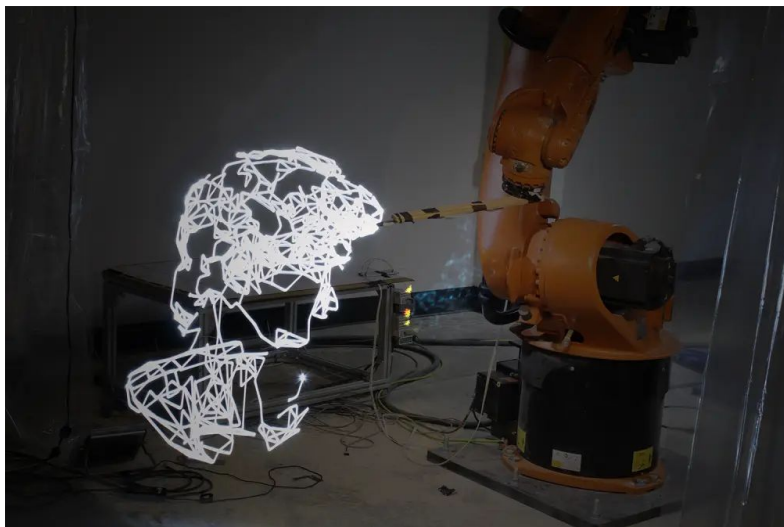
<https://robodk.com/blog/lights-out-robot-painting/>



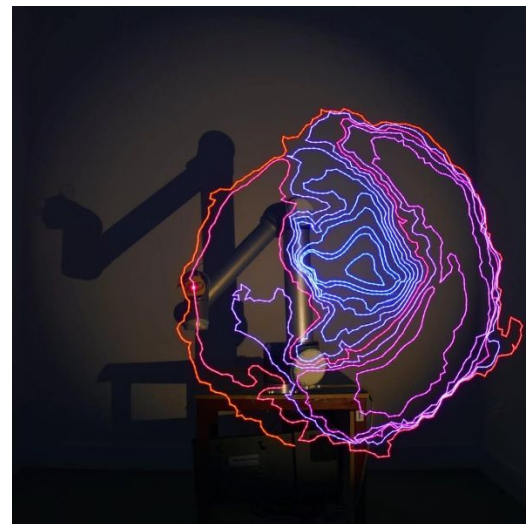


<https://www.jordan-ariel.com/paintedbyeveryone>



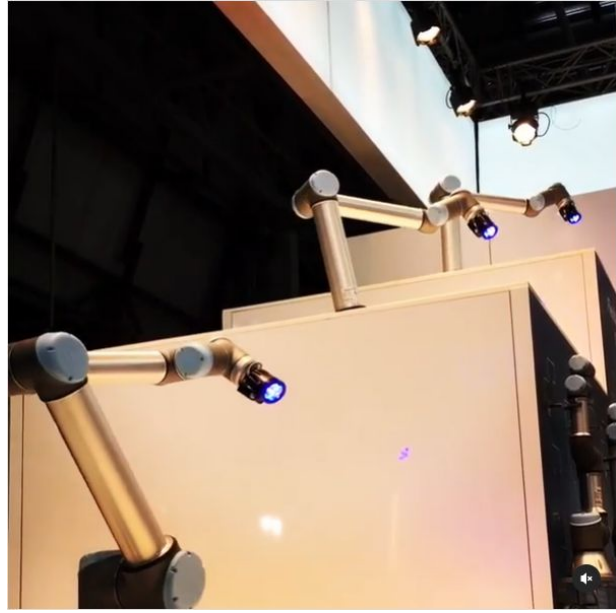
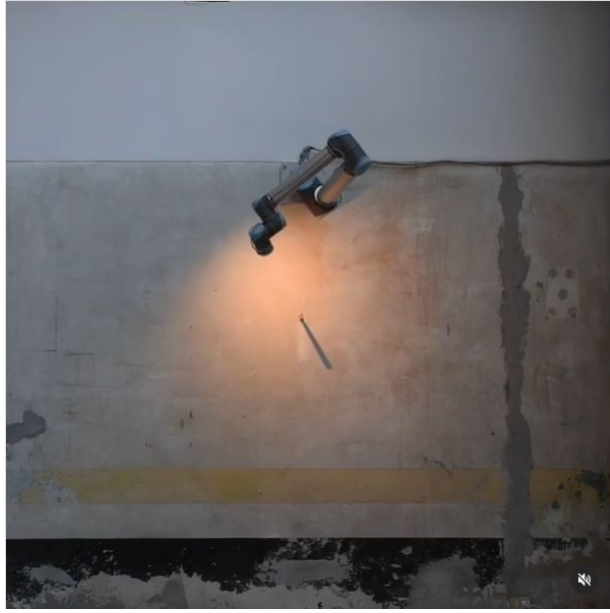
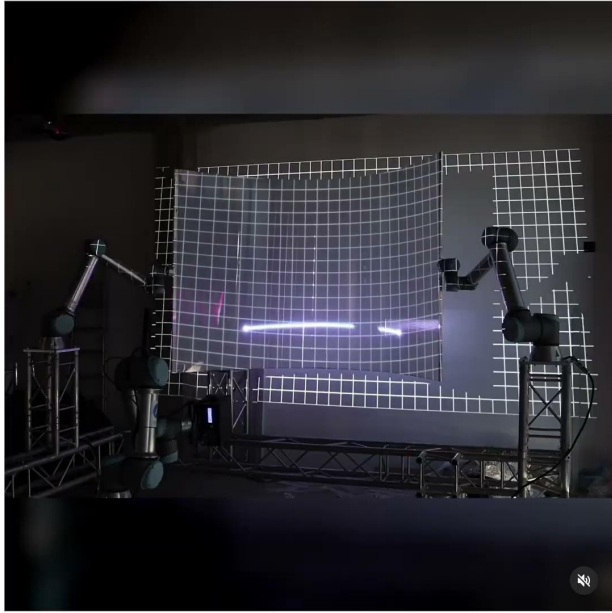


<https://jonathanmalott.com/portfolio.html?id=0>

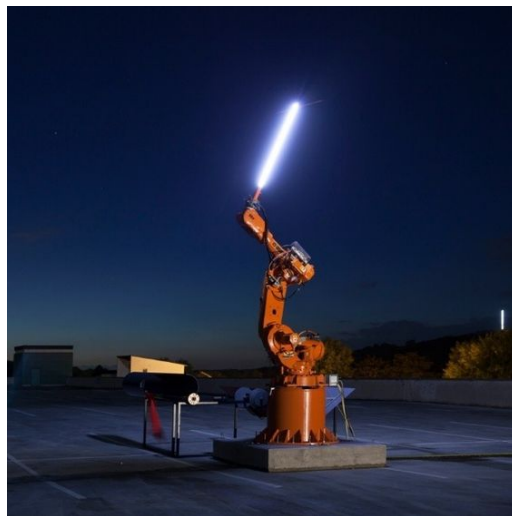


Drawing with other materials - LED





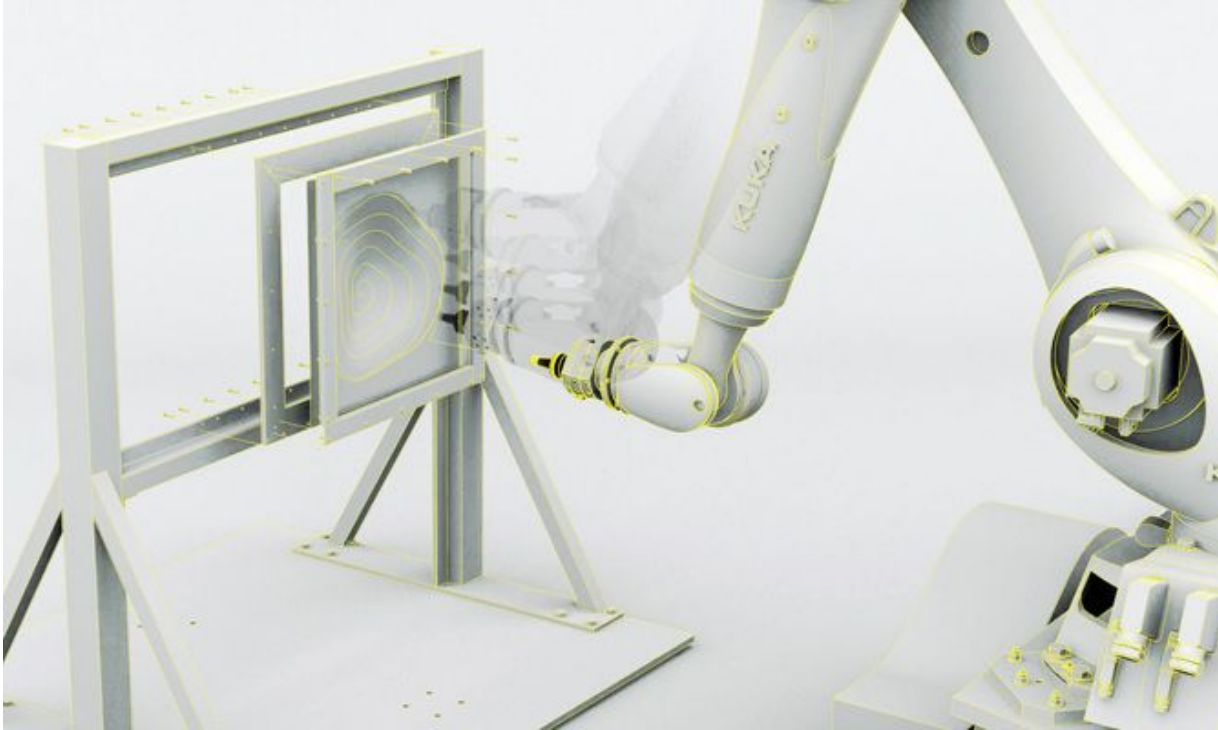
<https://www.instagram.com/p/Cj71LEHjoYr/>





<https://vimeo.com/132981872>

Incremental Forming



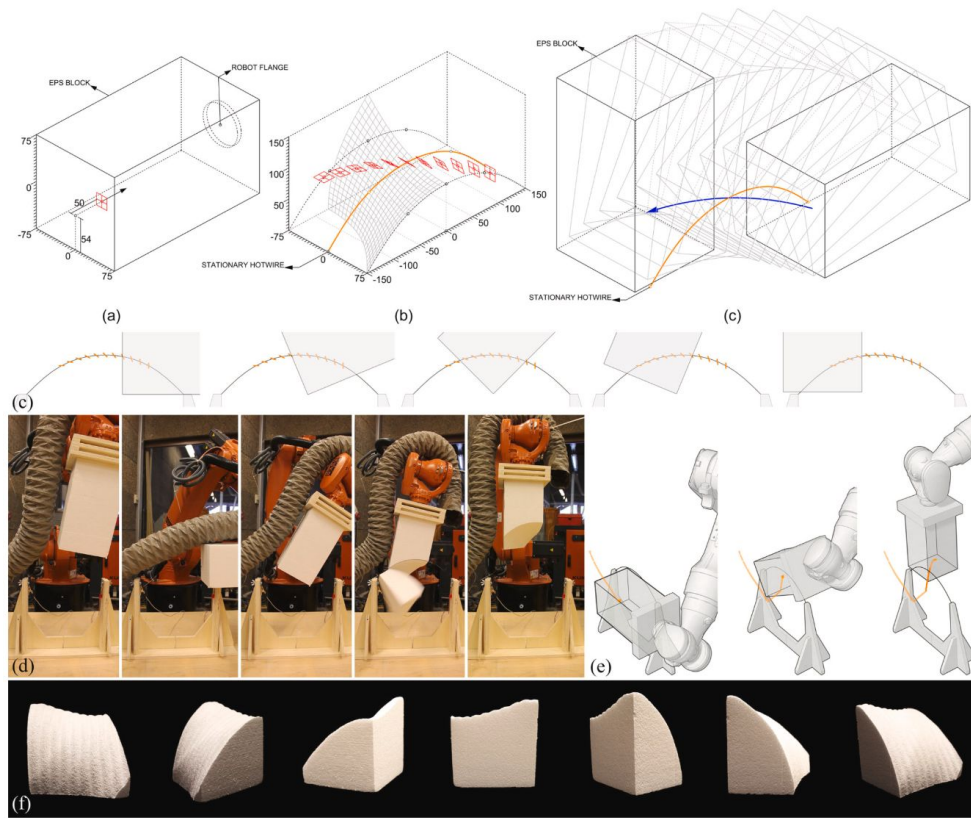
<https://www.ammarkalo.com/Incremental-Sheet-Metal-Forming>

## Incremental Forming





Performance Art - Can't Help Myself

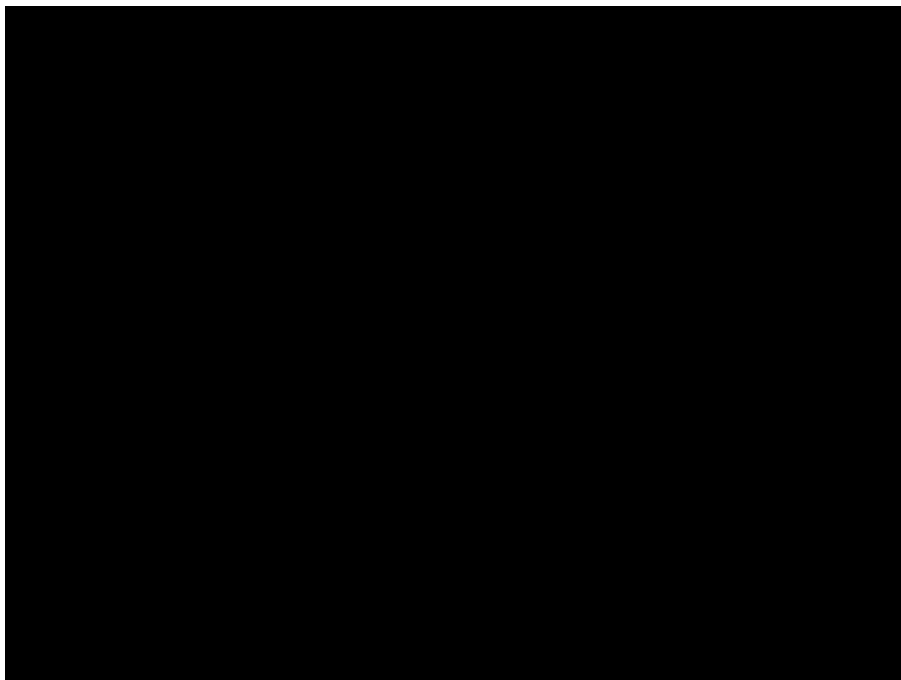


<https://www.designcoding.net/non-linear-robotic-hotwire-cutting/>

<https://www.designcoding.net/robotic-arm-in-basic-design-studio/>

<https://www.designcoding.net/robotic-fabrication-student-project-microwave/>

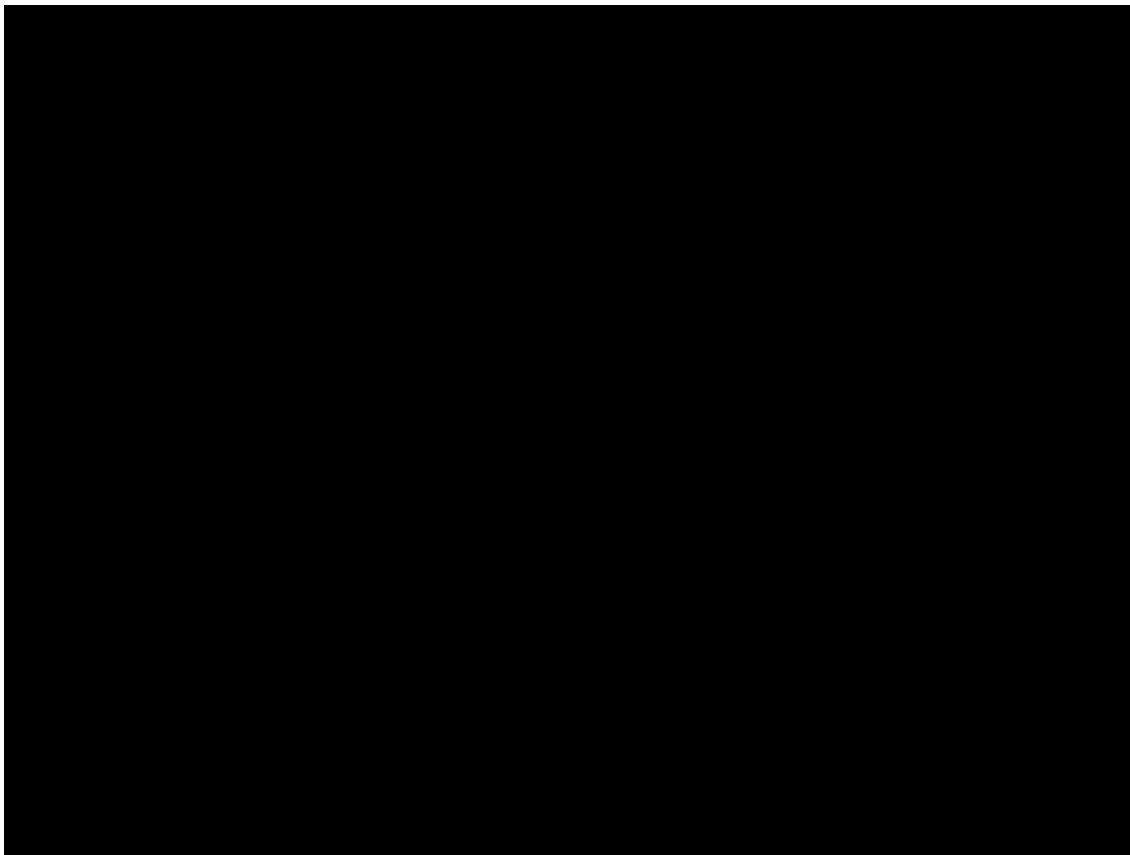
# Non-Linear Robotic Hotwire Cutting



<https://www.instagram.com/p/BFt5WUjArcU/>



[https://www.formlab.schoolofarts.be/instructions/doku.php?id=ur10\\_robot\\_arm:ur10\\_robot\\_arm](https://www.formlab.schoolofarts.be/instructions/doku.php?id=ur10_robot_arm:ur10_robot_arm)



<https://www.instagram.com/p/CEXDb5ml5g6/>





<https://penplotterartwork.com/blog/2021/11/06/beyond-the-pen-plotter-art-made-with-paint-sand-more/>



<https://www.universal-robots.com/blog/counter-productive-robotics-artists-use-ur10-robot-to-accomplish-the-impossible/>



# HABITS OF THE ANTHROPOCENE



### Cavillon: A Bending Active Pavilion

[illegible]

Cavillon : A Bending Active



Urban MYCOskin

[illegible]

Urban MYCOskin

Evolutionary Optimized  
Catenary Wooden Roof  
Structures[illegible]

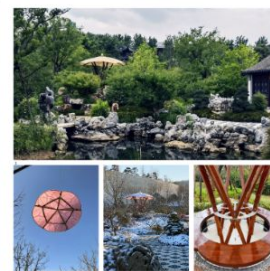
Evolutionary Optimized Catenary Wooden Roof Structures



Meta Form  
Co-Creating Open Architecture

<p><b>ALEXANDER GRASSER</b>  <b>Institute of Architecture</b>  <b>and Media, GRS University</b>  <b>of Technology</b></p>	<p>Through research the presence of "space" through time and how space is being shaped, understood and perceived in relation with a right to the city and design process. The research is concerned with the role of the city in society, the role of the city in the future and the role of the city in the past.</p>	<p>1. Innovation and "the space" of the city          2. Innovation: "the space" of the city          3. Innovation: "the space" of the city          4. Innovation: "the space" of the city</p>
<p><b>ALEXANDRA HANSEN</b>  <b>Institute of Architecture</b>  <b>and Media, GRS University</b>  <b>of Technology</b></p>	<p>The research is concerned with the role of the city in society, the role of the city in the future and the role of the city in the past.</p>	<p>1. Innovation and "the space" of the city          2. Innovation: "the space" of the city          3. Innovation: "the space" of the city          4. Innovation: "the space" of the city</p>

Meta Form Co-Creating Open Architectures



#### Functionally Graded Knitted Composite

<p><b>WAD WAD</b>  <b>Southland University</b></p> <p><b>YONG LUI</b>  <b>Southland University</b></p>	<p>The first step was to identify the target population of the research. In this case, the target population was the students of the University of Southland. The next step was to identify the variables to be studied. In this case, the variables were the students' perceptions of the university's commitment to social responsibility and the students' perceptions of the university's commitment to environmental sustainability. The third step was to design the research instrument. In this case, the research instrument was a questionnaire that was designed to measure the students' perceptions of the university's commitment to social responsibility and the students' perceptions of the university's commitment to environmental sustainability. The fourth step was to collect the data. In this case, the data was collected from the students of the University of Southland. The fifth step was to analyze the data. In this case, the data was analyzed using statistical software. The sixth step was to interpret the results. In this case, the results were interpreted in the context of the research objectives. The seventh step was to write the report. In this case, the report was written in a clear and concise manner. The eighth step was to present the findings. In this case, the findings were presented to the students of the University of Southland. The ninth step was to conclude the research. In this case, the research was concluded by the students of the University of Southland.</p>
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MeiTing

Towards Adaptive  
Addition Manufacture

<p><b>LINSHIYU MAI</b> Carnegie Mellon University</p>	<p>"Through my research, I hope to help people understand why people do what they do. I am interested in the social factors that influence people's behavior. I am currently working on a project that explores the role of social norms in shaping people's behavior. I am also interested in the role of culture in shaping people's behavior. I am currently working on a project that explores the role of culture in shaping people's behavior."</p>	<p>1. I am currently working on a project that explores the role of culture in shaping people's behavior. I am also interested in the role of culture in shaping people's behavior. I am currently working on a project that explores the role of culture in shaping people's behavior."</p>
<p><b>JINGYANG LIU</b> Carnegie Mellon University</p>	<p>"I am currently working on a project that explores the role of culture in shaping people's behavior. I am also interested in the role of culture in shaping people's behavior. I am currently working on a project that explores the role of culture in shaping people's behavior."</p>	<p>2. I am currently working on a project that explores the role of culture in shaping people's behavior. I am also interested in the role of culture in shaping people's behavior. I am currently working on a project that explores the role of culture in shaping people's behavior."</p>
<p><b>JOSHUA BARD</b> Carnegie Mellon University</p>	<p>"I am currently working on a project that explores the role of culture in shaping people's behavior. I am also interested in the role of culture in shaping people's behavior. I am currently working on a project that explores the role of culture in shaping people's behavior."</p>	<p>3. I am currently working on a project that explores the role of culture in shaping people's behavior. I am also interested in the role of culture in shaping people's behavior. I am currently working on a project that explores the role of culture in shaping people's behavior."</p>
<p><b>DANA CHEN</b> Carnegie Mellon University</p>	<p>"I am currently working on a project that explores the role of culture in shaping people's behavior. I am also interested in the role of culture in shaping people's behavior. I am currently working on a project that explores the role of culture in shaping people's behavior."</p>	<p>4. I am currently working on a project that explores the role of culture in shaping people's behavior. I am also interested in the role of culture in shaping people's behavior. I am currently working on a project that explores the role of culture in shaping people's behavior."</p>

code: [C00000](#) ADAM 2023 EADTS OF THE AUTOSPHERE

Towards Adaptive Additive Manufacturing

# FABRICATE

A triennial series of conference publications that began with 'Making Digital Architecture' in 2011 at The Bartlett School of Architecture, University College London. Each FABRICATE conference and book evolves from an open call for 'works in progress', with a submission deadline ten months prior to the conference. The call is designed to attract submissions from industry and practice as well as academia, and asks for an abstract on the trajectory of the work, including where it will be by the time the conference takes place. Selected projects are then invited to resubmit full papers for a second round. The conference theme emerges during this phase, while papers are also categorised into notional sub-themes.

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<b>Fabricate 2024</b>  Fabricate 2024: Creating Resourceful Futures is the fifth volume in the serie...	<b>Fabricate 2020</b>  Fabricate 2020 is the fourth title in the FABRICATE series on the theme of di...	<b>Fabricate 2014</b>  FABRICATE is an international peer reviewed conference that takes place every...	<b>Fabricate 2011</b>  FABRICATE is an international peer reviewed conference that takes place every...	<b>Fabricate 2017</b>  Bringing together pioneers in design and making within architecture, construc...

<https://www.uclpress.co.uk/collections/series-fabricate>



RunwayML: Posenet

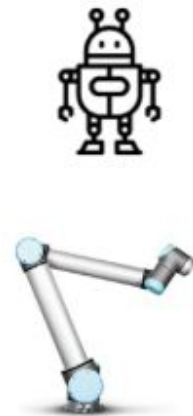
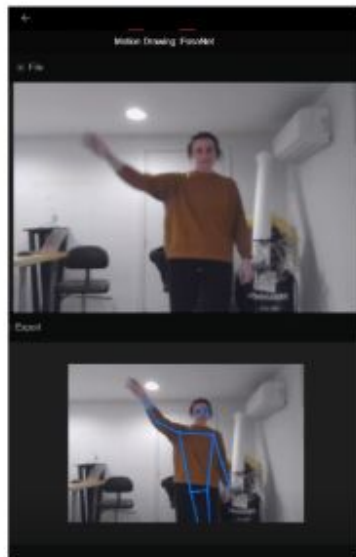
Construct Points in GH

Curves

Filter

Pen Type

Machina > UR10



## **16.5 - Intro to Robotic Fabrication in Architecture - 3D Robotic Movement**

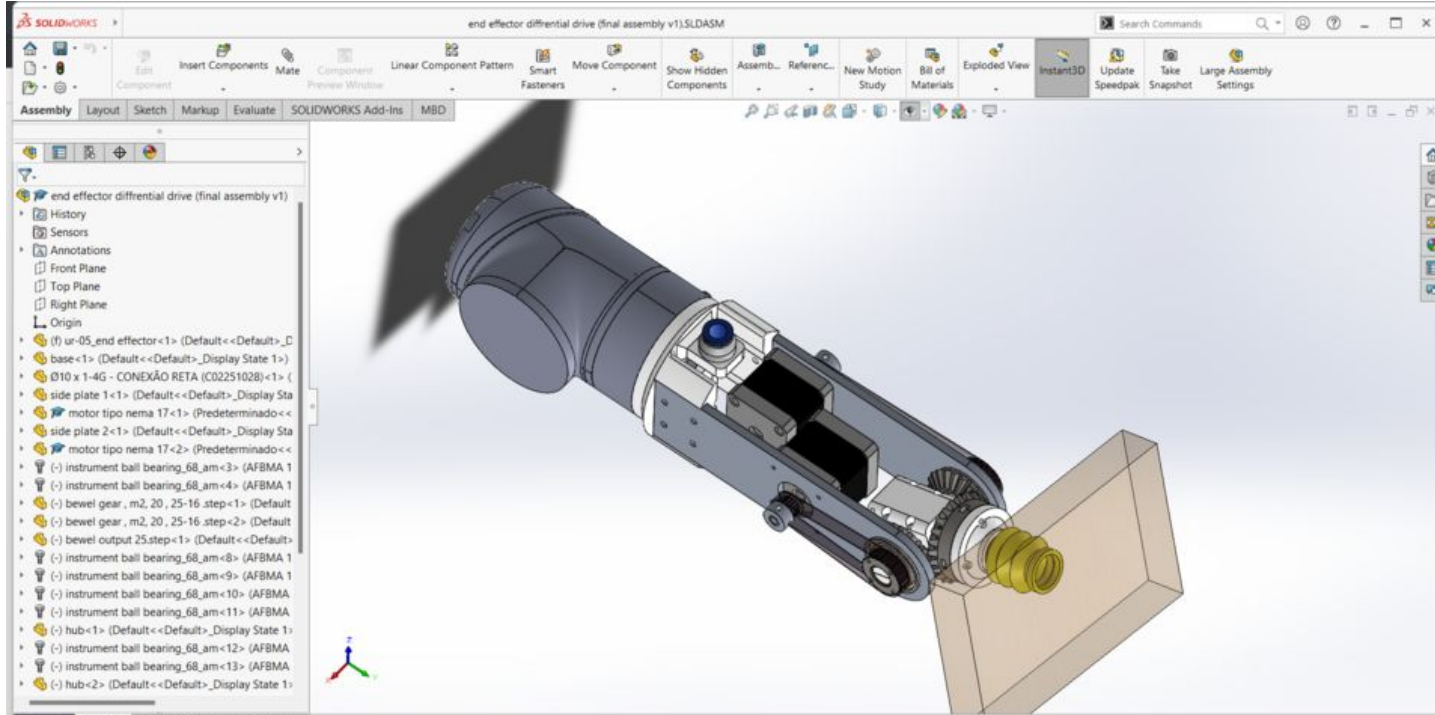
Assignment 2 - complex drawing (groups of 2)

- Design a tool for the robot
- Design a drawing
- Draw a design with your drawing machine

Tasks bank:

- Draw with a brush / water colors
- Draw on a non-straight canvas/on a 3d object
- Draw with a special tool (coal / sponge / other)
- Draw with light
- Sand drawing
- Different end effector (camera / flag / scanner / lights)
- Glazing
- Stamps

# End-Effector Links



<https://grabcad.com/library/end-effector-for-universal-robot-ur-05-1>



<https://makerworld.com/en/models/431133>





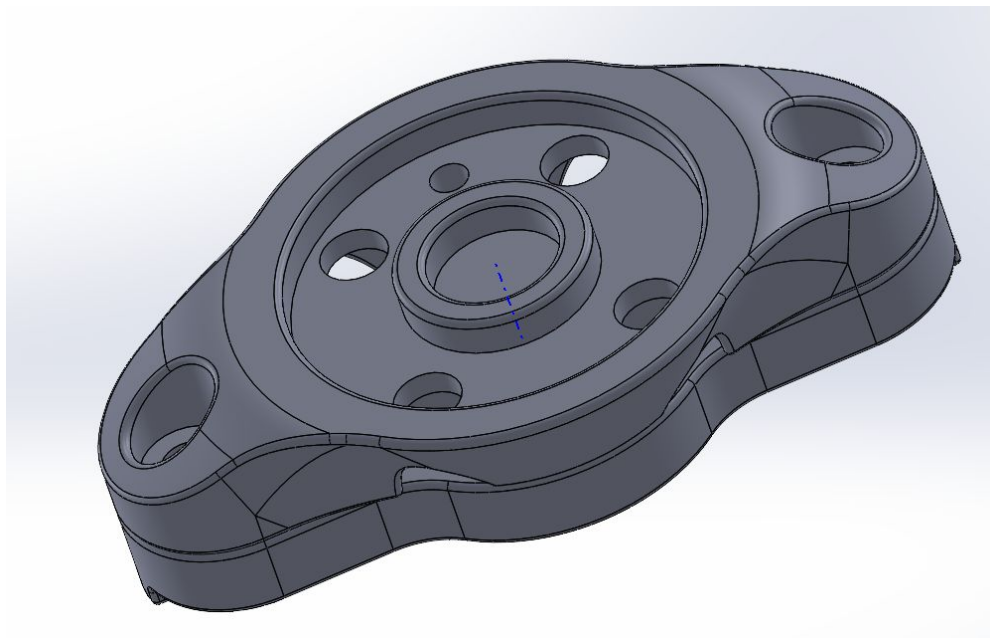
<https://cults3d.com/en/3d-model/tool/adaptateur-cobot-ur5-e-pour-ibc-tools>



<https://www.thingiverse.com/thing:2037443>



[https://www.formlab.schoolofarts.be/instructions/doku.php?id=ur10\\_robot\\_arm:ur10\\_robot\\_arm](https://www.formlab.schoolofarts.be/instructions/doku.php?id=ur10_robot_arm:ur10_robot_arm)



<https://www.thingiverse.com/thing:6274435>



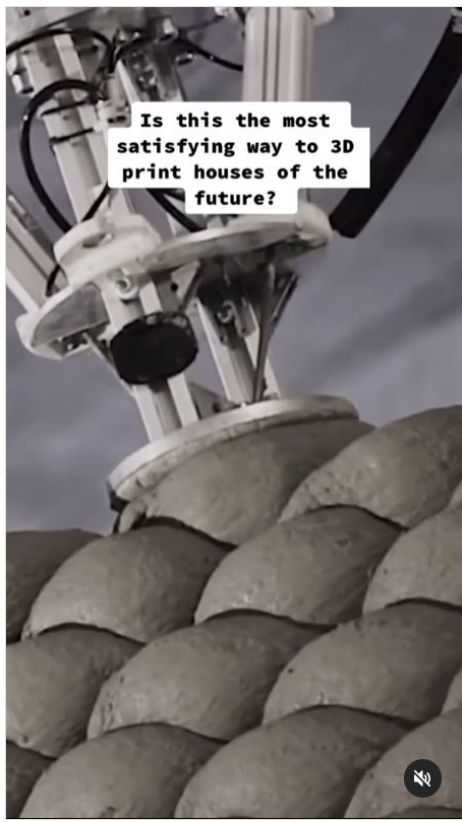
<https://www.thingiverse.com/thing:4532361>



<https://www.printables.com/en/model/805071-felting-needle-implement-for-ur5>



<https://www.project-curiosity.com/project/robot-impact-printing-clay>



<https://www.instagram.com/p/Cyg6C6vrsNi/>



<https://www.instagram.com/p/C58DXels8JN/>



<https://www.instagram.com/p/Cs9D2SguEHl/>