

Reuse Networks

Jeffrey V. Nickerson

Collaborators:

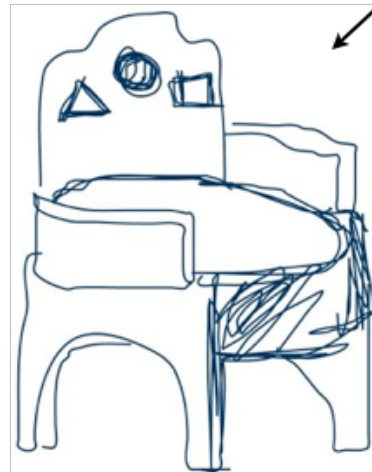
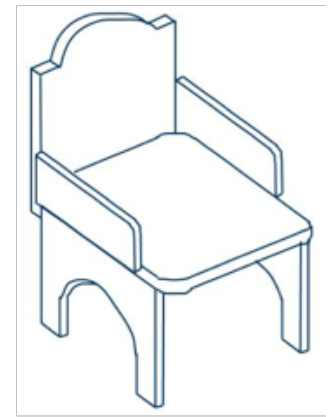
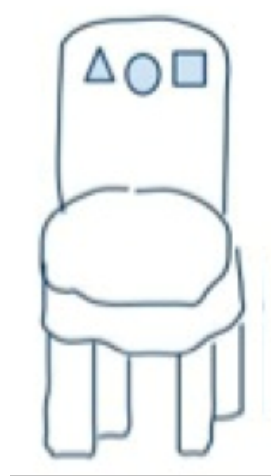
Harris Kyriakou, Yue Han, Pinar Ozturk. Gaurav Sabnis

Acknowledgements: everyone in the room

This material is based upon work supported by the National Science Foundation under grants IIS-0968561, IIS-1211084, IIS-1422066, CCF-1442840.



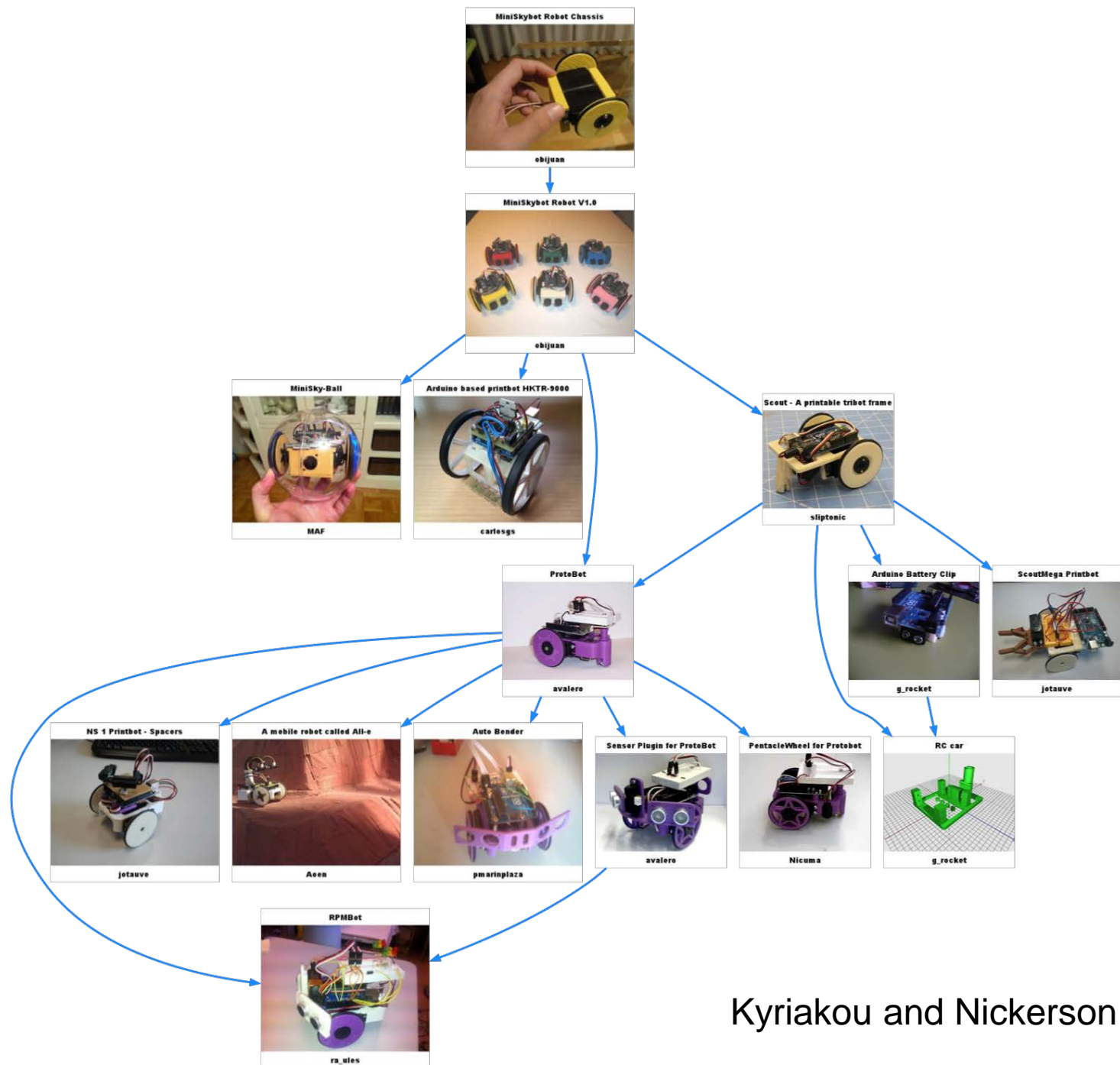
Examples

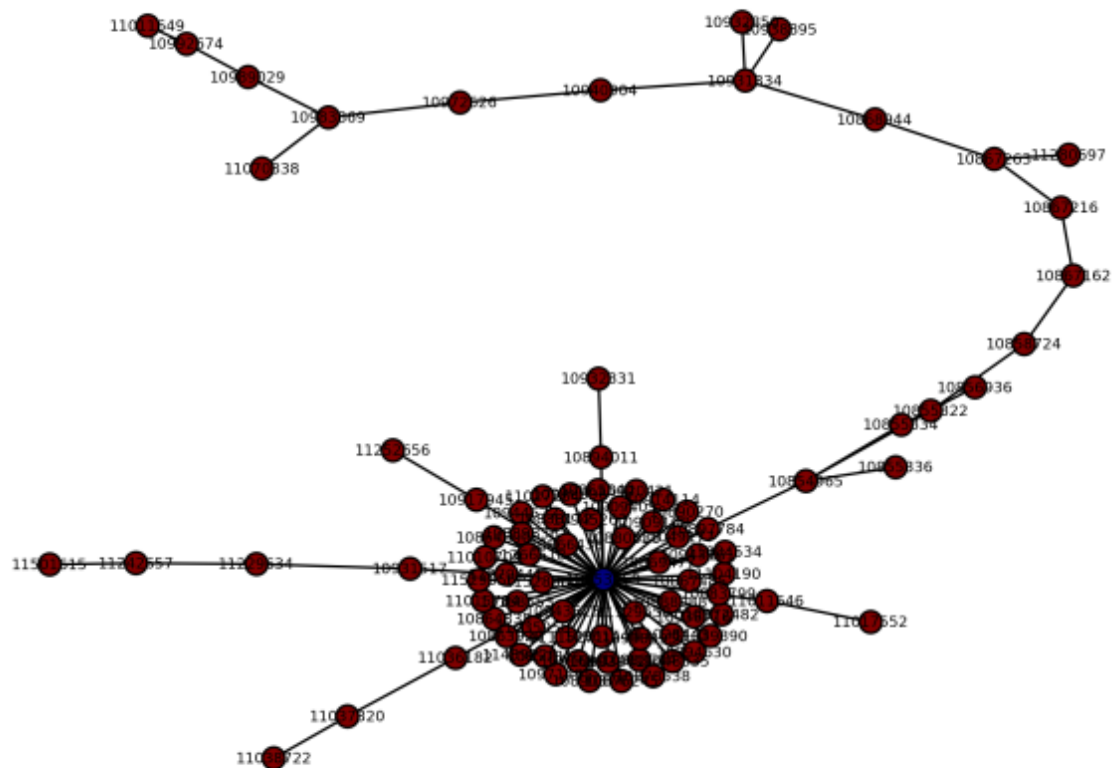
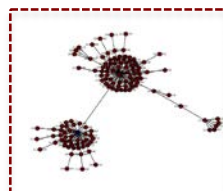
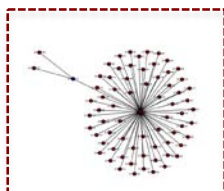
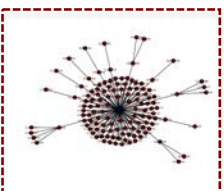
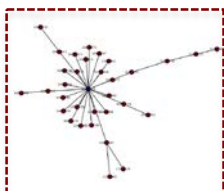
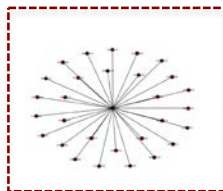


Yu and Nickerson, 2013



Kyriakou and Nickerson 2013

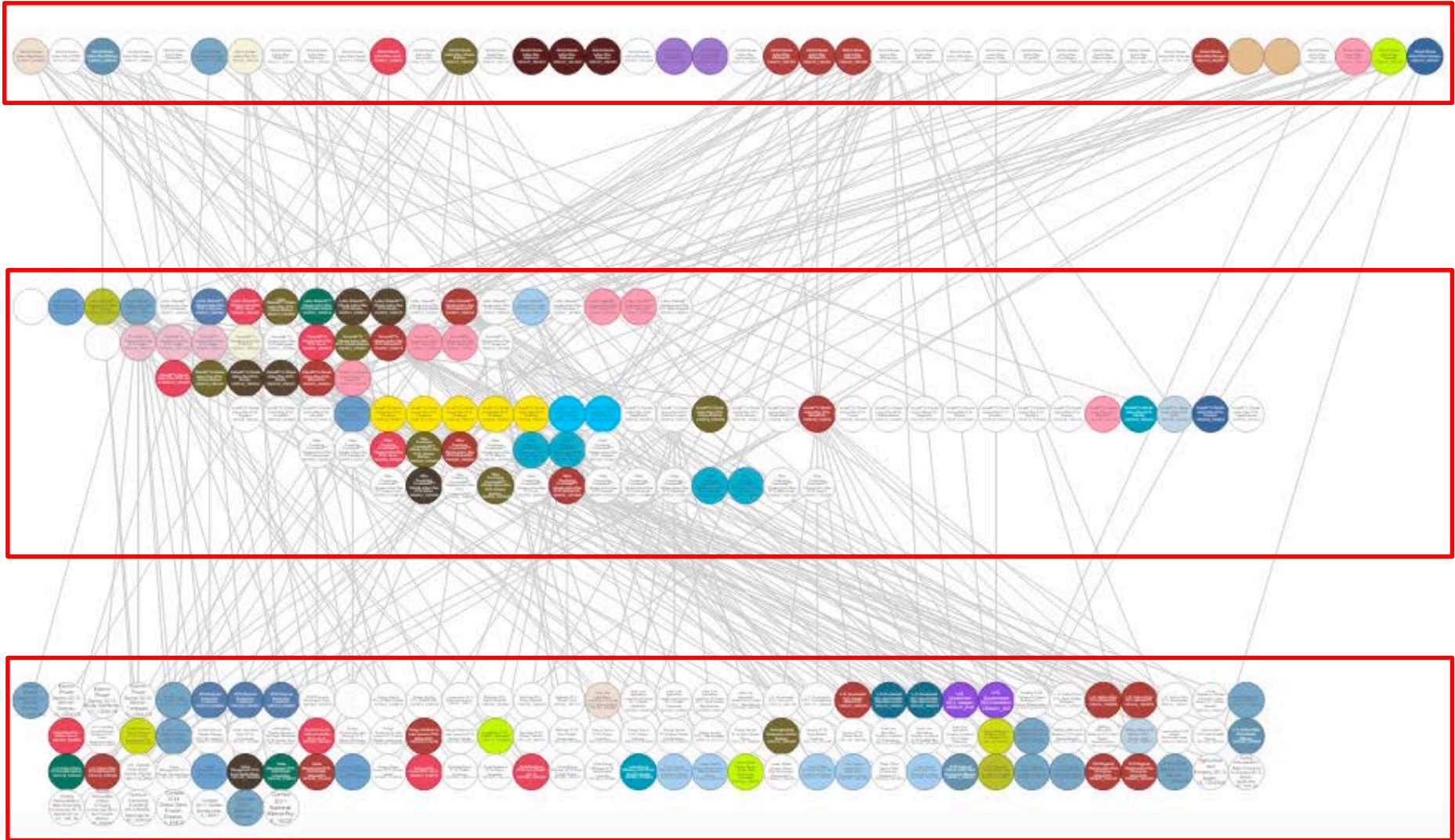




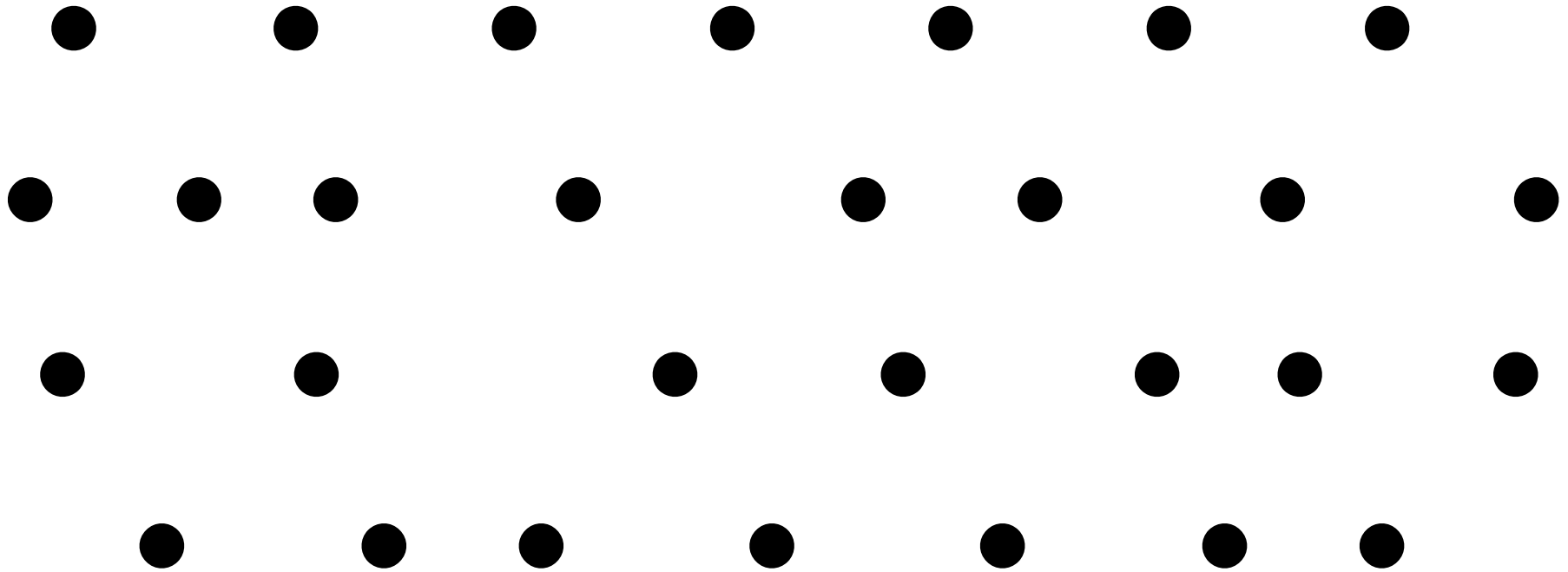
Han and Nickerson 2013

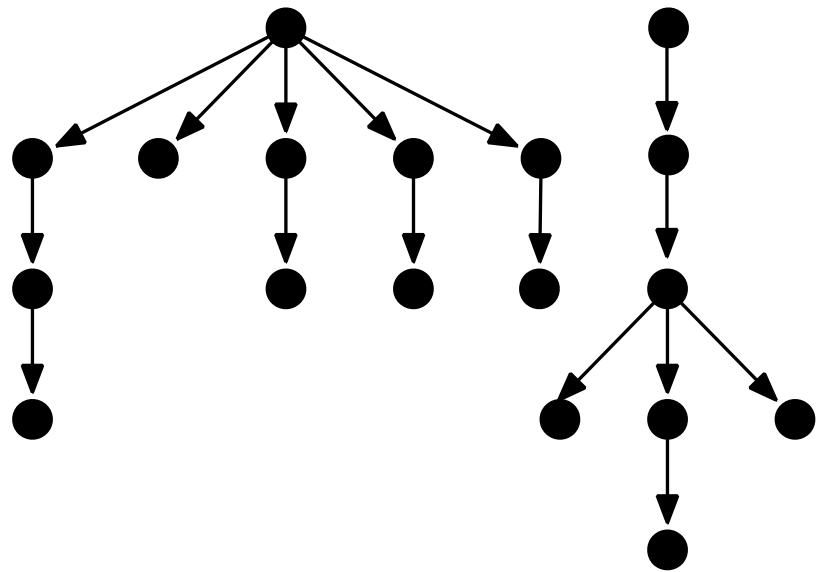
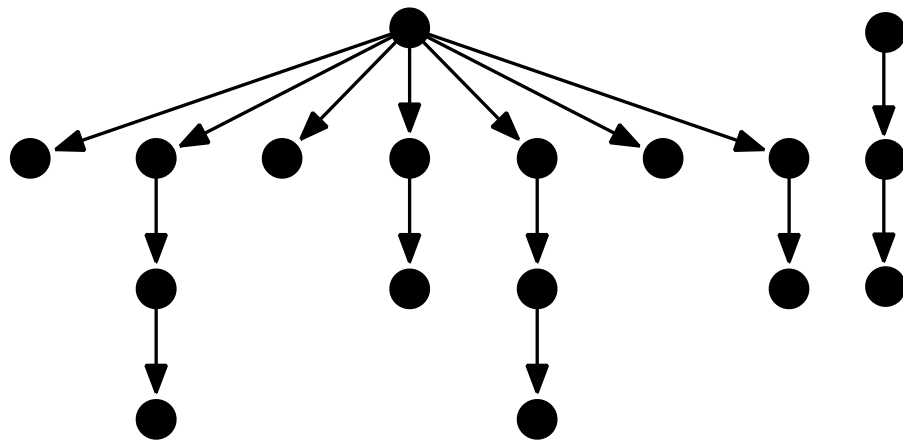


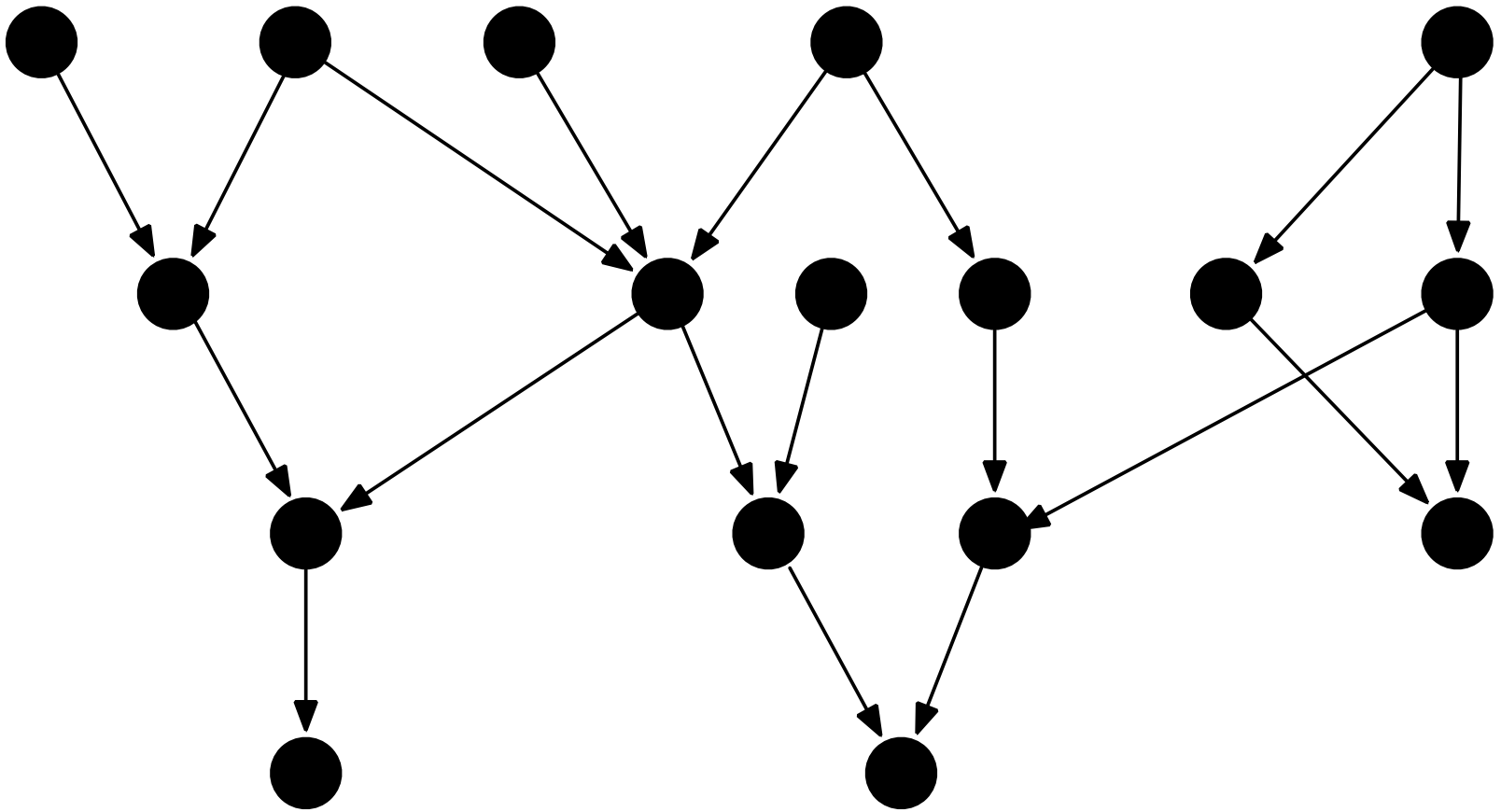
Global Proposals Regional Proposals Other Proposals

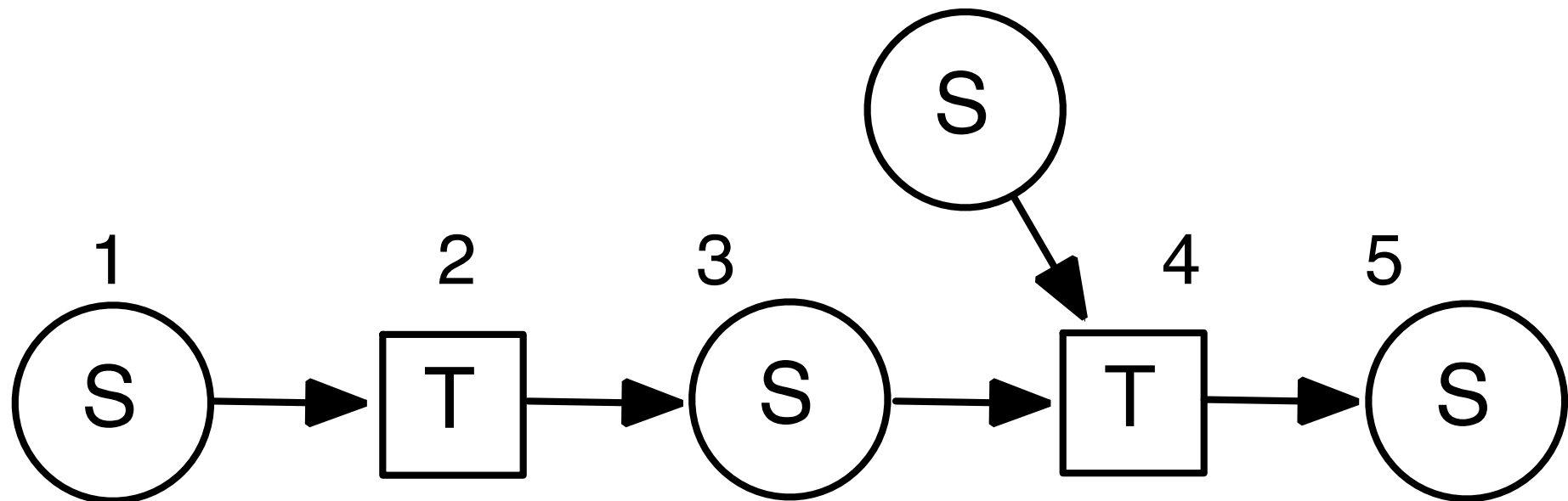
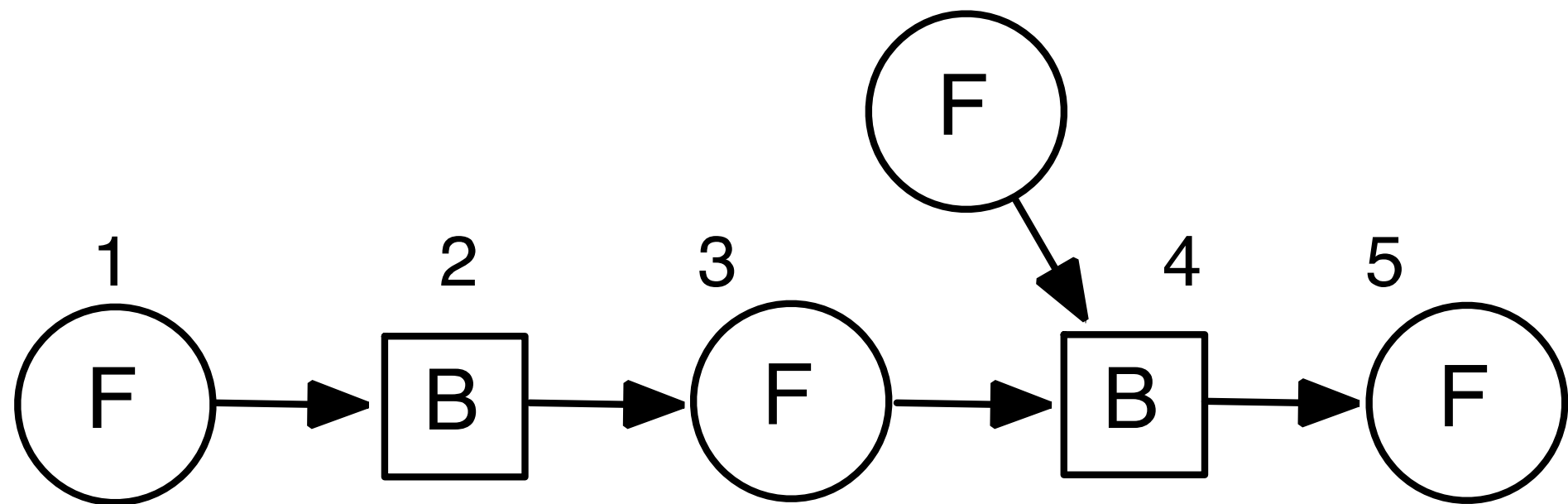


Focus	Environment	Collaborators
Reuse Depth	Scratch	Yue Han
Reuse Feedback	Climate Colab	Yue Han, Thomas Malone
Productivity Modularity Style	Wikipedia	Pinar Ozturk, Ann Majchrzak
Reuse Customization	Thingiverse	Harris Kyriakou, Gaurav Sabnis







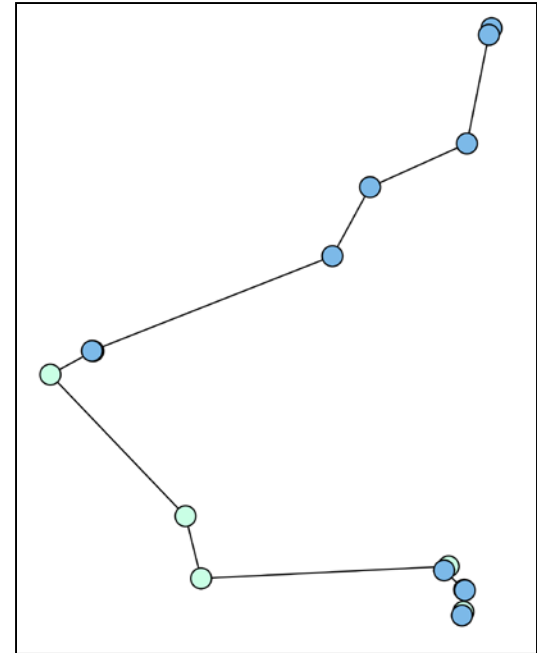
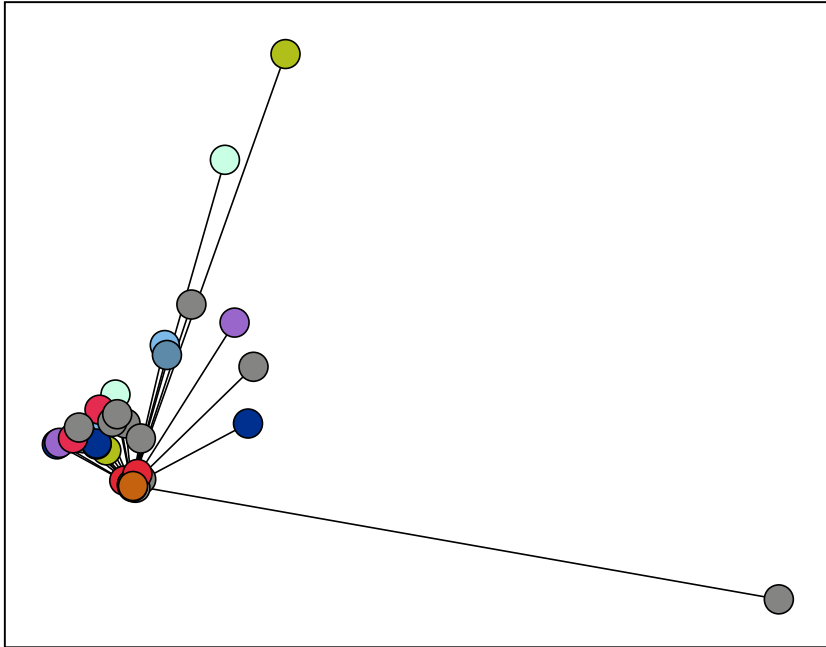


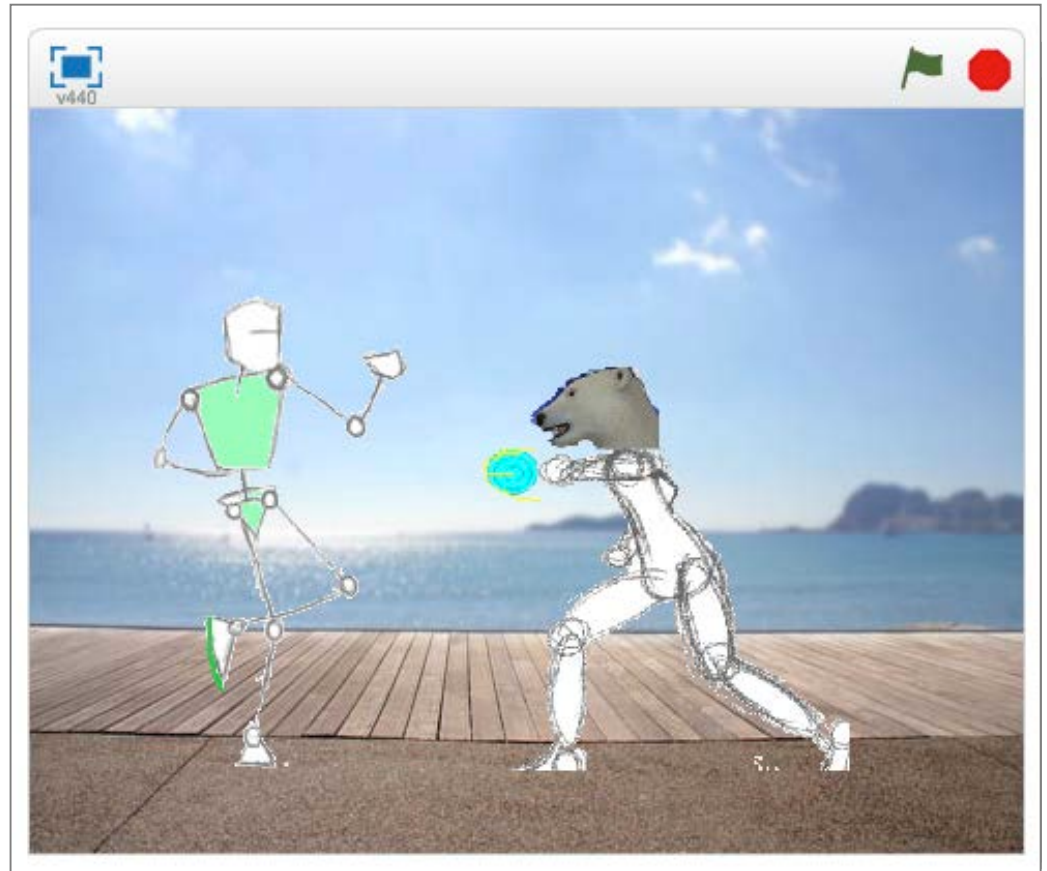
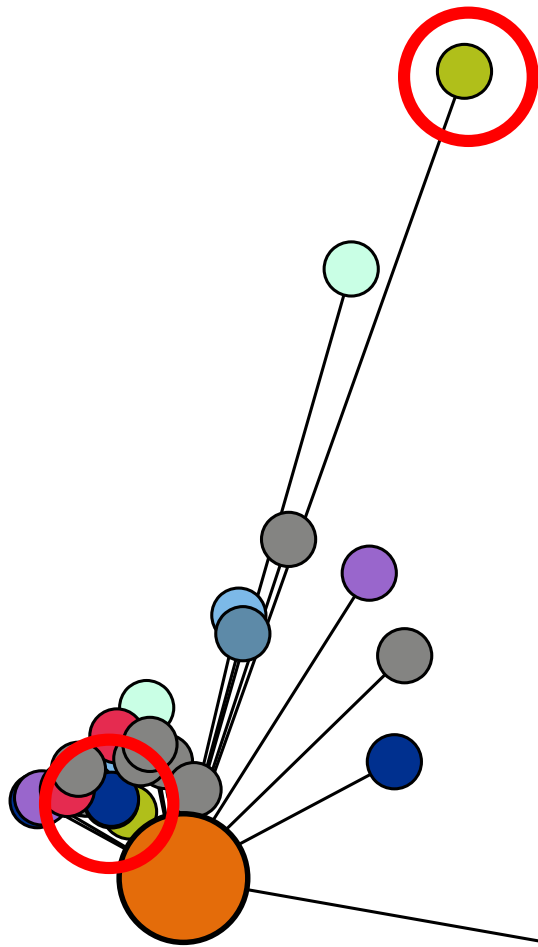


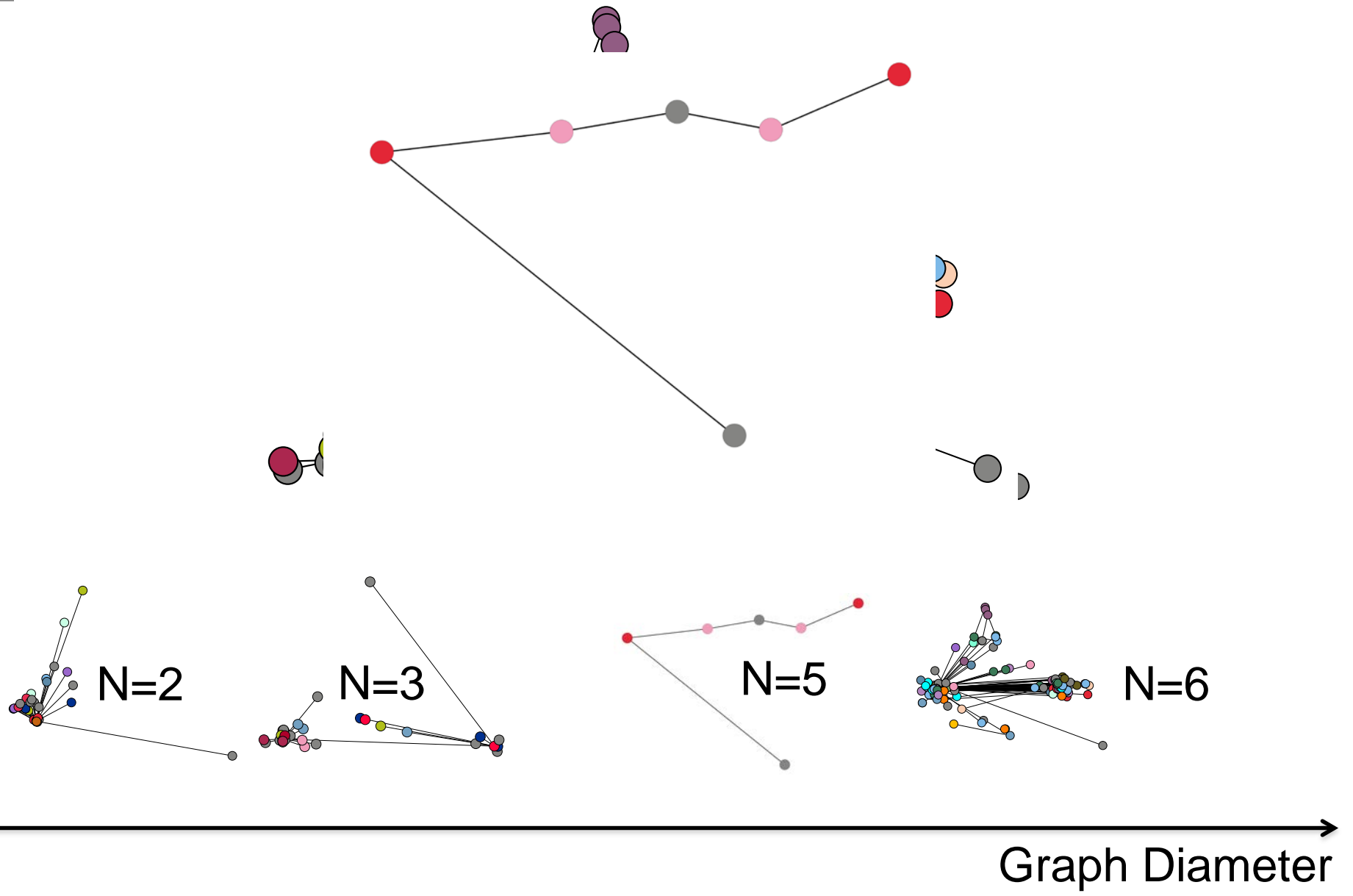
Depth



Depth of exploration

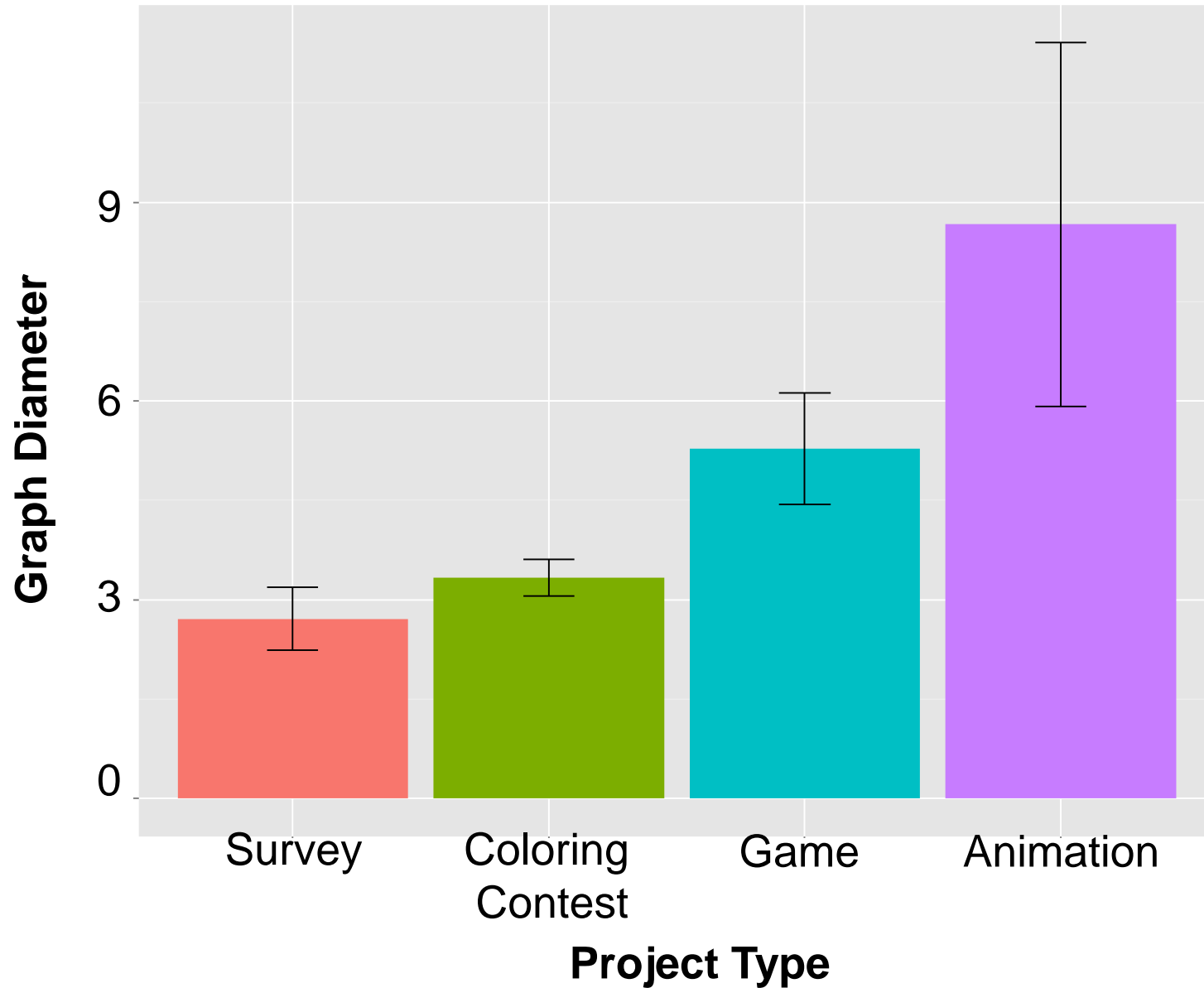









Exploration Depths of Different Project Types







Proposal for **Transportation 2014** by eRev

Batteries on the move for a more efficient wo

DESCRIPTION

CONTRIBUTORS 3

COMMENTS 9

EVALUATION

POINTS

Show history

Pitch

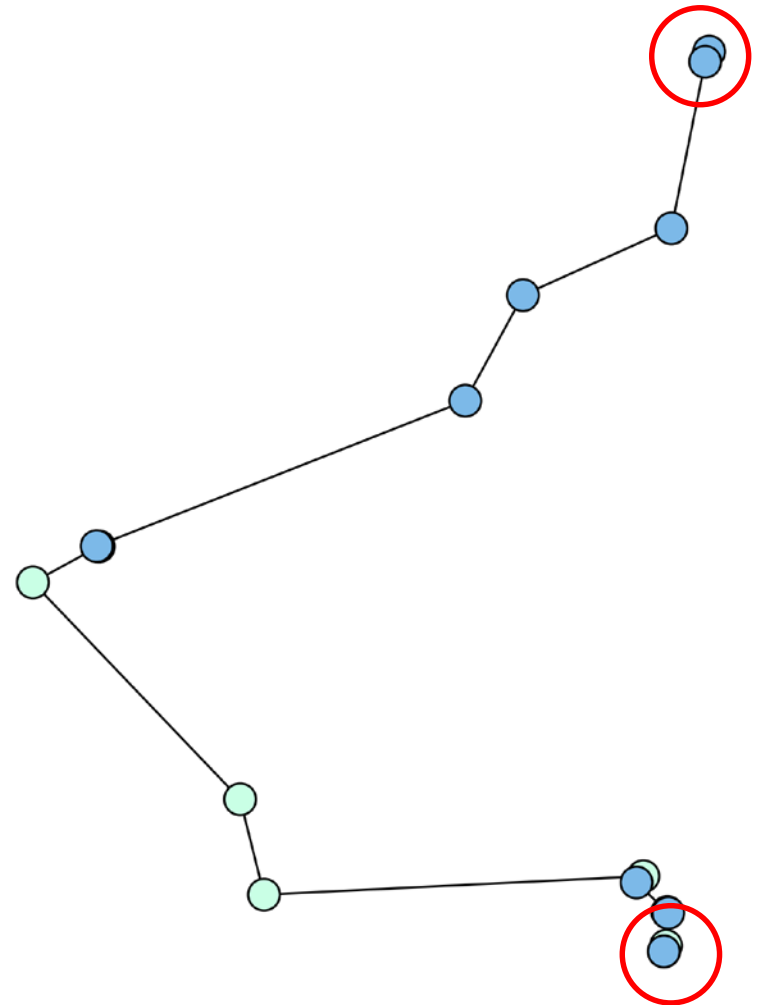
eRev finances V2G-capable electric vehicles so they provide grid storage, generate revenue, and cost less than traditional vehicles.

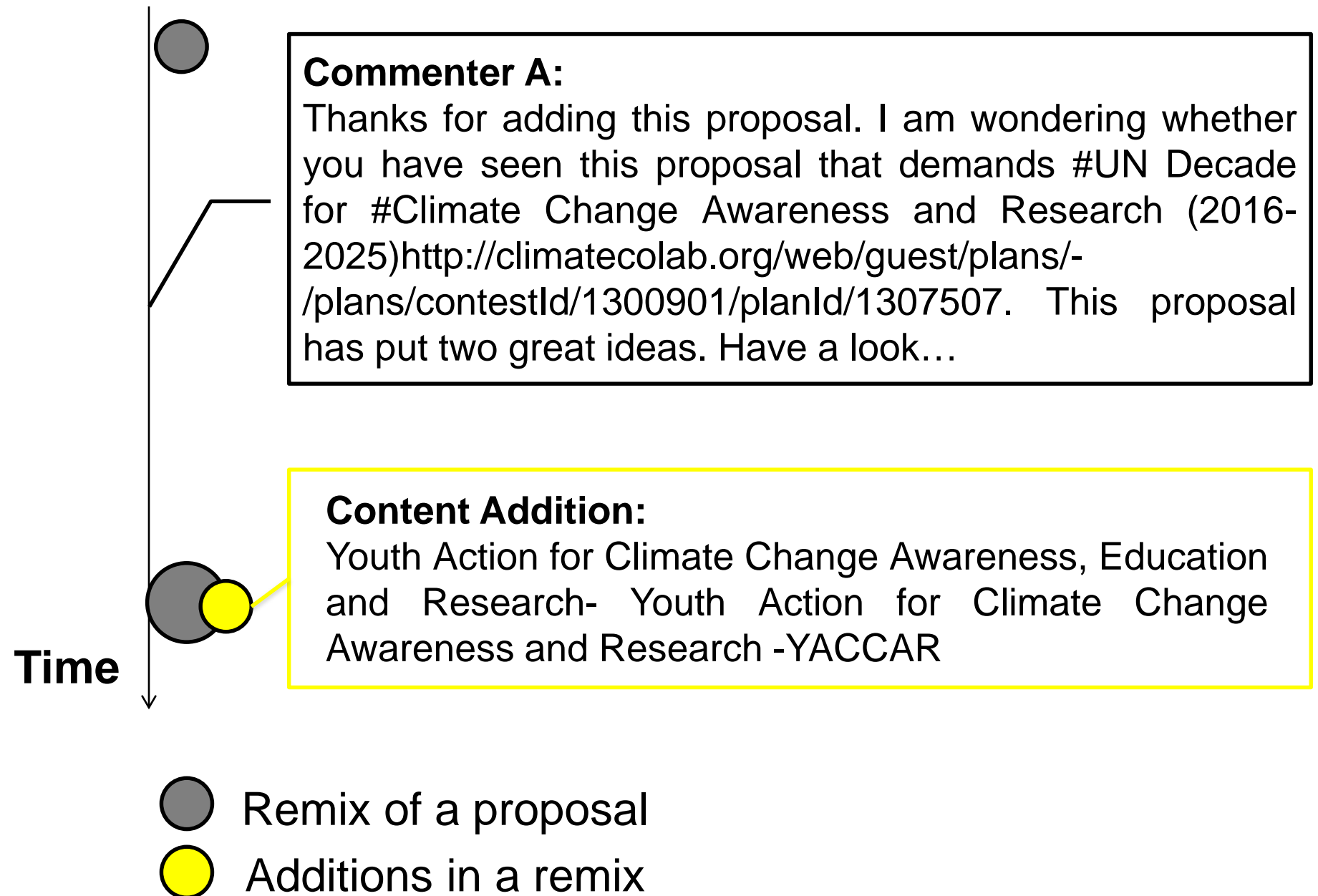
Description

Summary

Our start-up company eRev finances V2G-capable electric vehicles so people can use electric vehicles at no additional costs, reducing CO2 and improving efficiency for the grid. We propose two main actions:

- Regional transmission organizations (RTOs) should enact policy to allow vehicles to participate as electricity storage for the grid. This is currently implemented in PJM RTO





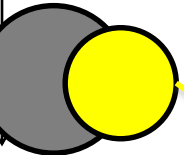


Commenter B:

...My main worry is that you might not actually answer to the contest question: "**How can we enable young people to take leadership** now, and make a difference against climate change?" You should probably **add more discussion** on what the youths themselves should to promote the goals of this proposal...

Comment from Proposal Contributor:

...Indeed, I could do more to explain how this proposal fits the category's goal of **empowering youth**. **This addition will happen soon...**



Content Addition:

How will it empower Youth Leadership? (3 paragraphs)

Time



Do comments increase the exploration depth of a remix network?

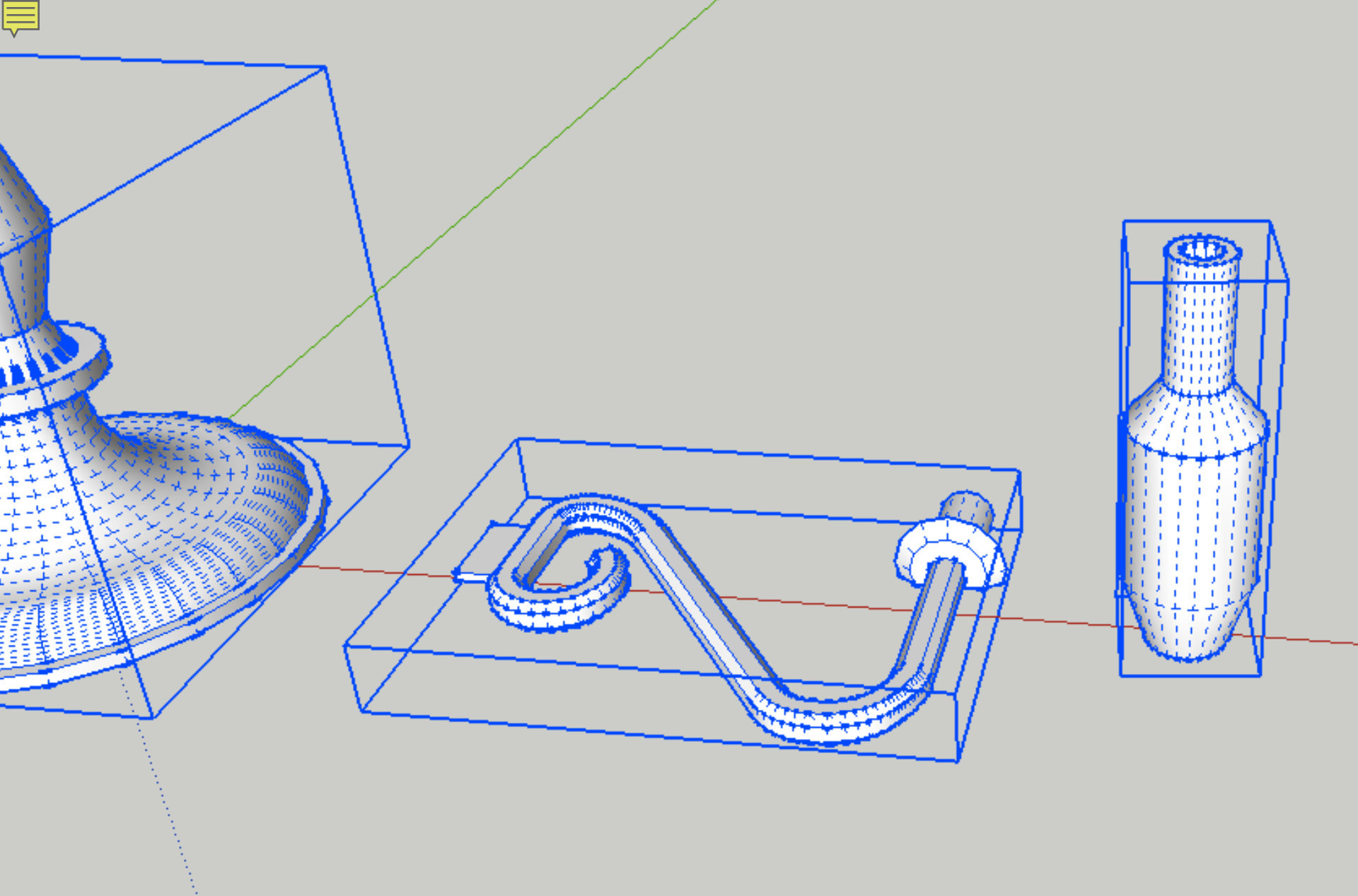


Analysis and Results

$$\text{Graph_Diameter}_i = \mu + \beta_1 \text{Comments}_i + \beta_2 \text{Contributors}_i + \beta_3 \text{Sequence_of_creation}_i$$

Comments Effects				
Variable	β	Std. error	T	Sig.
(Constant)	6.9435	0.9874	7.032	0.000*
Number of Comments	9.2469	1.5463	5.980	0.000*
Number of proposal Contributors	0.1576	1.0199	0.155	0.877
Sequence of proposal creation	-0.5868	1.5348	-0.382	0.703
Number of Observations		120		
R-Square		0.396		
Adjusted R-square		0.381		
Sig of model (p)		0.000*		







Glow Stick Candelabra

by Bioluminescence, published Aug 30, 2011



♥ Like	120
📁 Collect	156
💬 Comment	30
📝 I Made One	5
🔄 Remix It	5
🔗 Share	

 **Download This Thing!**



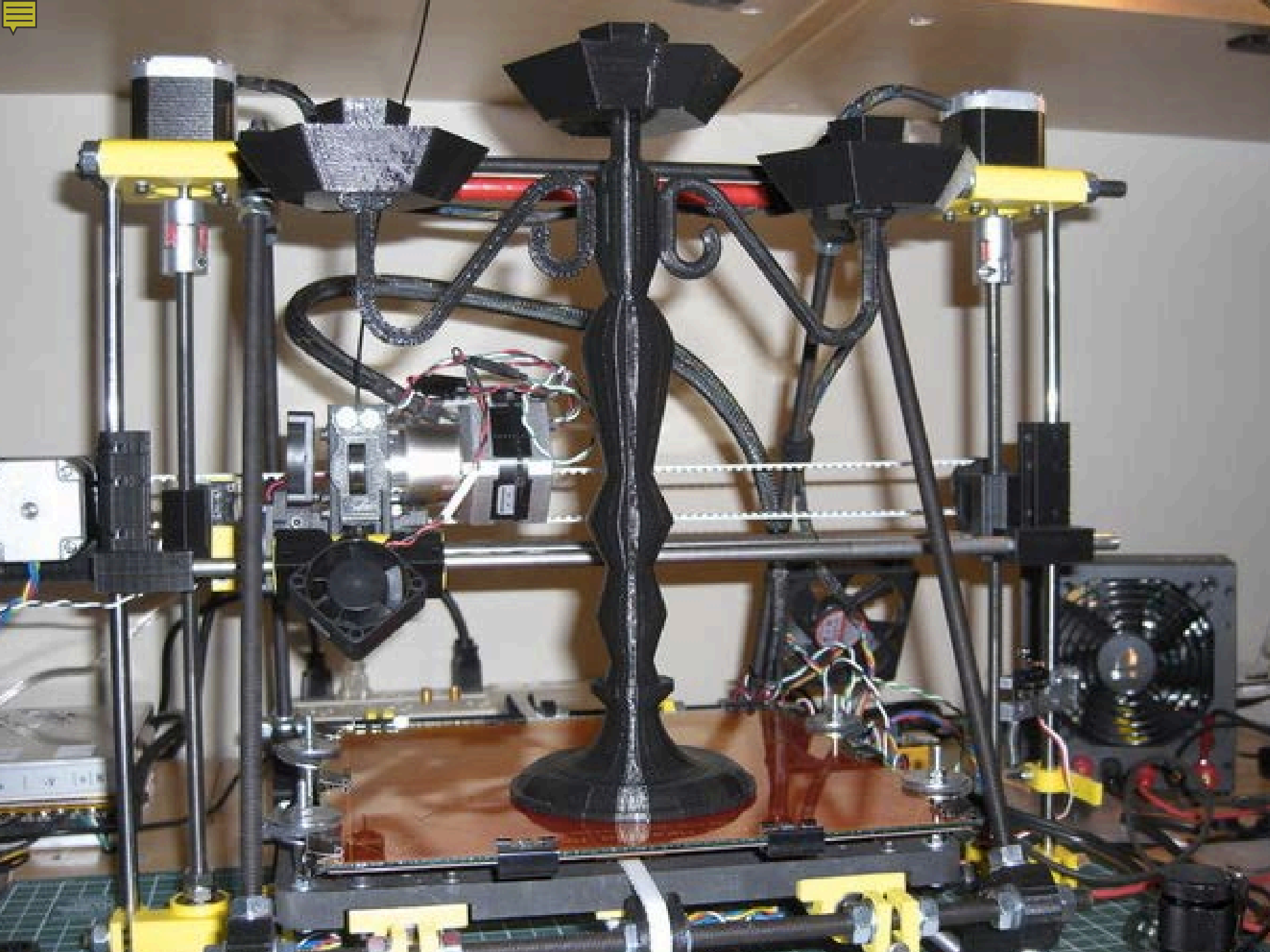
Candelabra Description

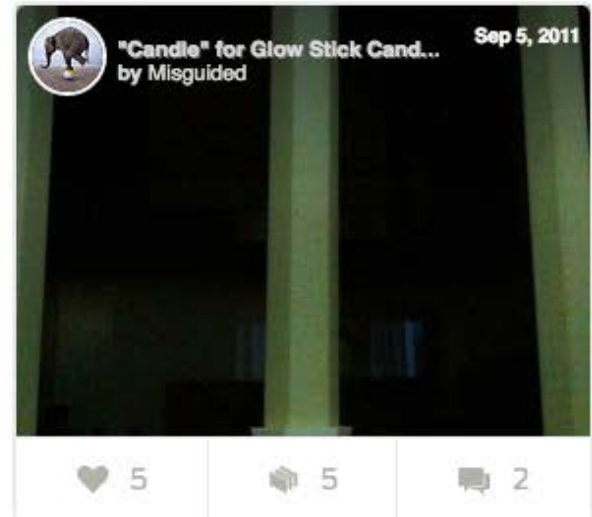
“Inspired by an item in the video-game, Deus Ex: Human Revolution, which totes itself as Cyber-Renaissance in art style, what we have here is a printable, good sized, glow-stick candelabra to bring a little neo-noir class to your home or work.

(In game, you'd find the relevant prop in Jensen's apartment.)

27.5cm (10.8") tall without glow-sticks 40cm (15.7") tall with glow-sticks installed. 152g (5.4oz) of plastic, printed and trimmed. **8hrs (approx) printing time.**

I had to take a few liberties with the design of the 'candle holding cups' for easier printing - those flat gentle curves couldn't survive without support. Instead, I went for a sharply faceted holder, which I personally prefer - **I like the low-poly look.**”







Reuse for replication

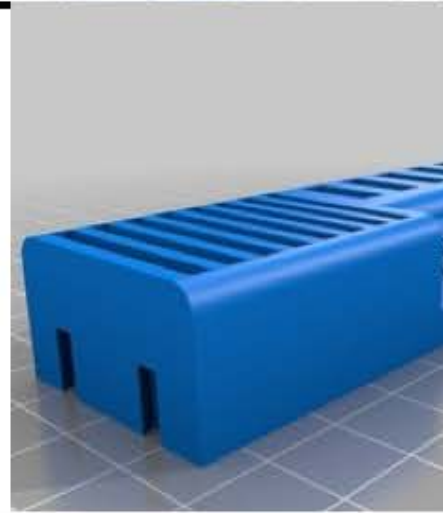
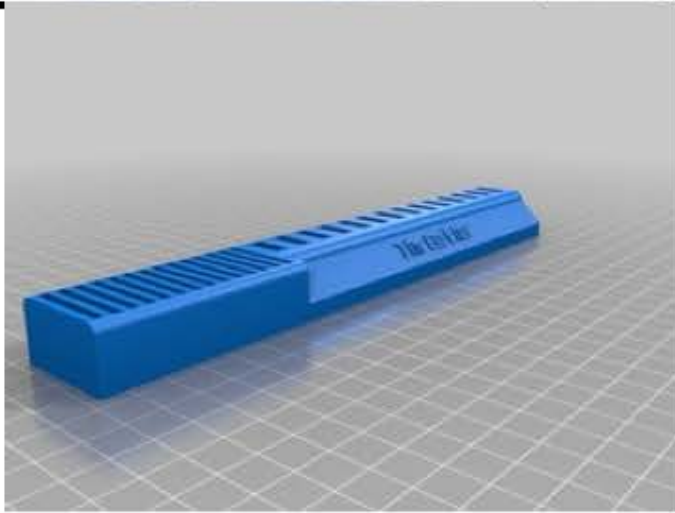
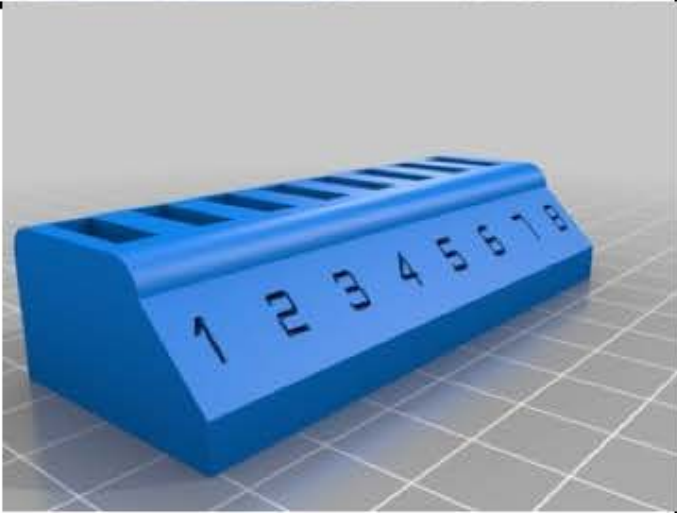
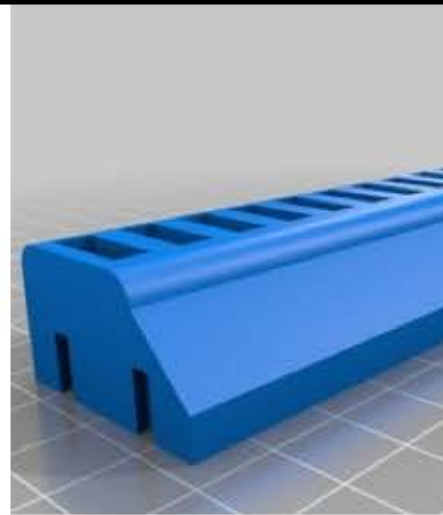
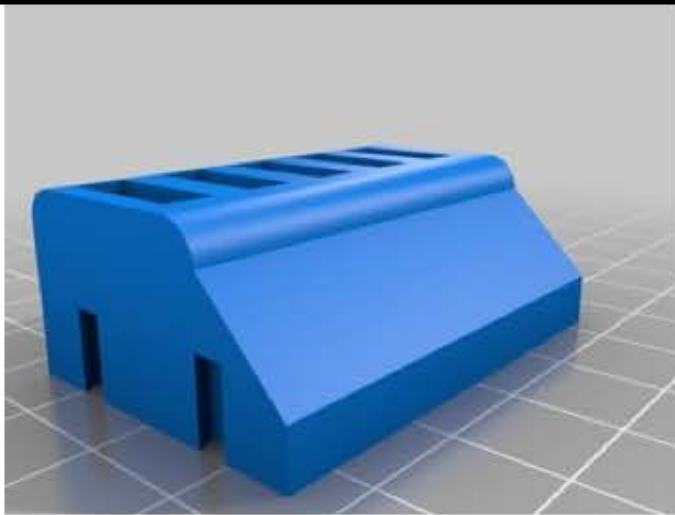
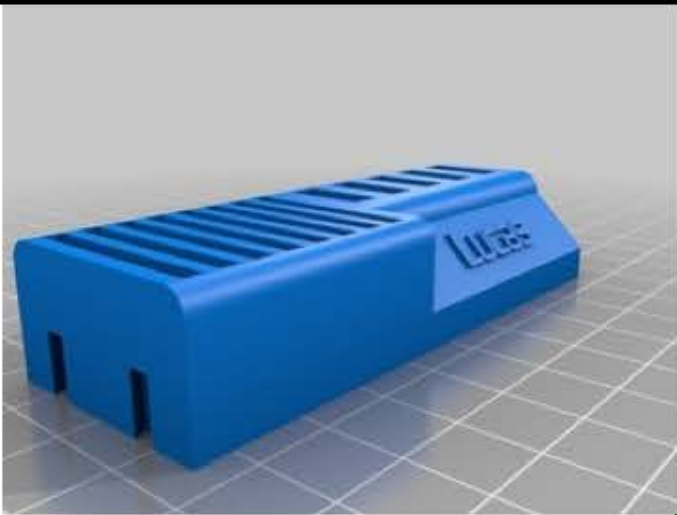
versus

Reuse for innovation

Majchrzak, Cooper and Neece, 2004



customizers
=configurators
=toolkits
=co-design platforms





Reuse for customization

Whistle Magic - create your own whistle - Your Whistle

Parameters

Rad Radius of the whistle in mm 27

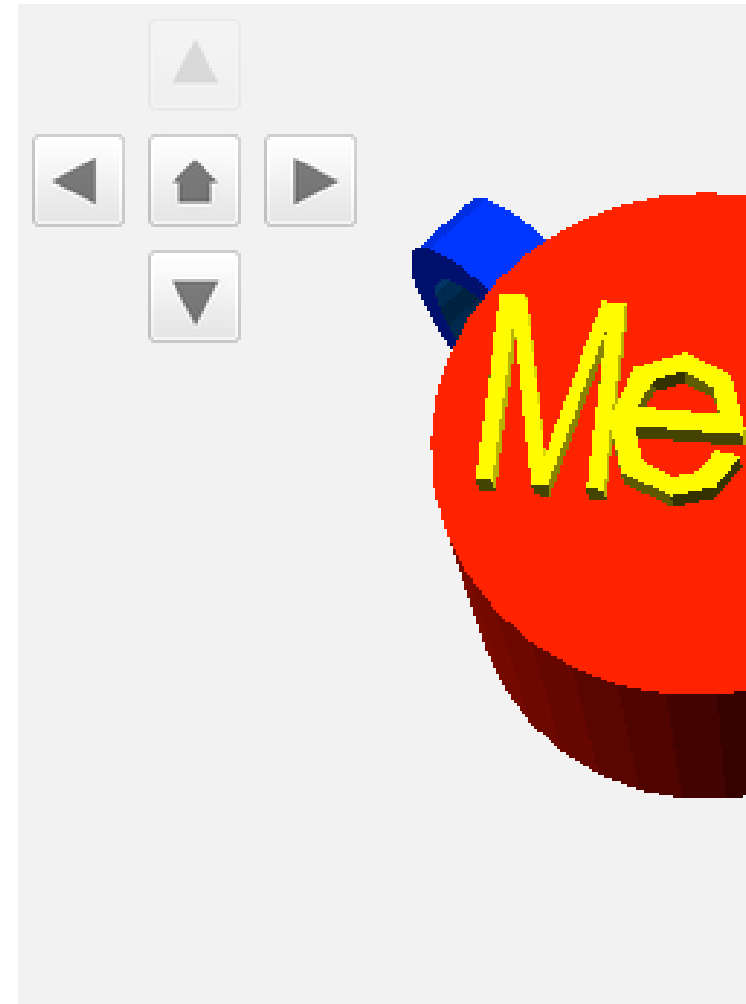
Hoehe Height of the whistle in mm 20

Laenge Length of blow element in mm 35

Make Holder Make a handle for whistle? 1

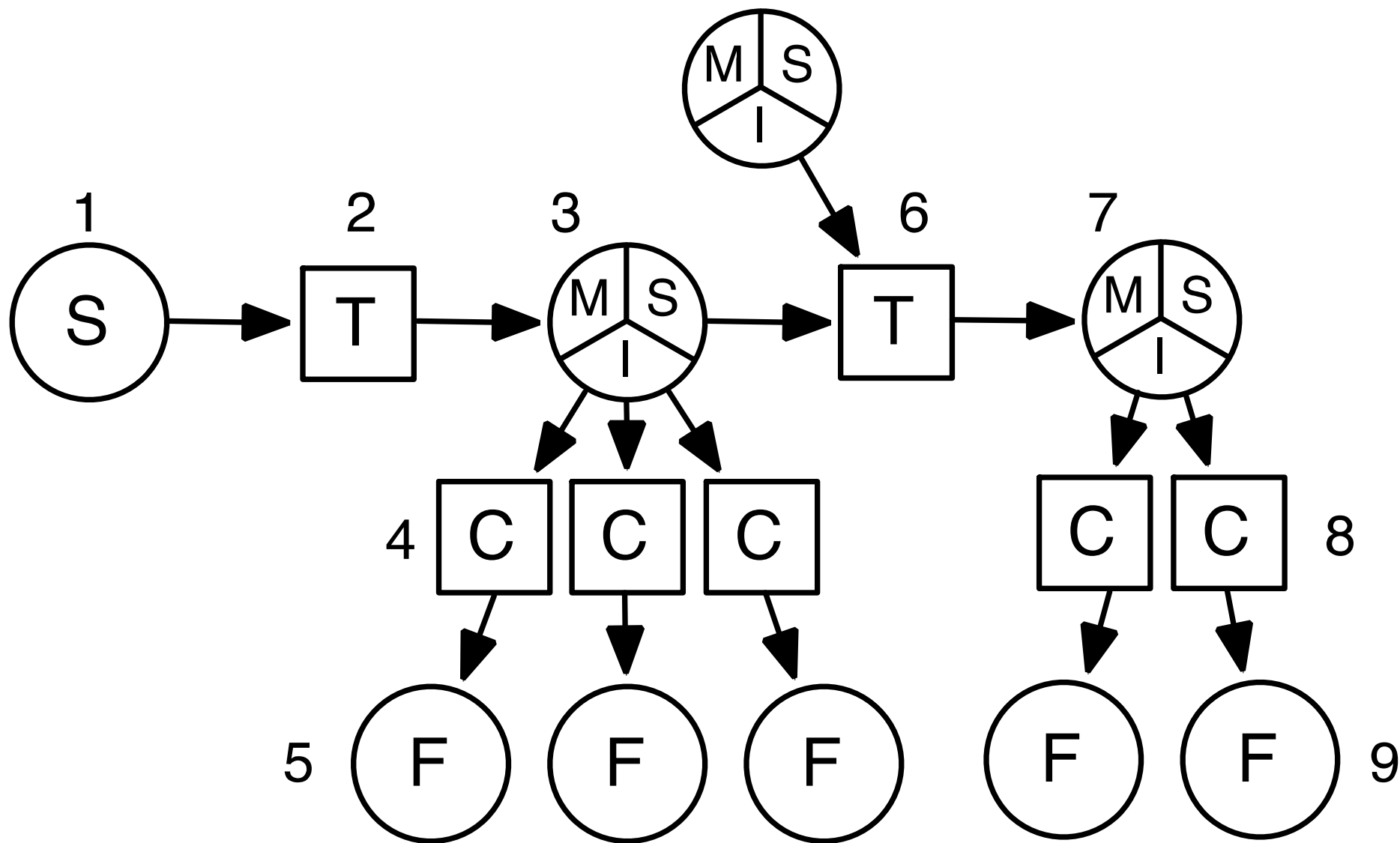
Textshow text to put on bracelet

Textsize Textsize on whistle 10





STL Model	<pre> facet normal 3.22623e-016 -1 2.65745e-016 outer loop vertex -34.8211 -2 11.2533 vertex -34.8211 -2 8.74667 vertex -34.1978 -2 6.31875 endloop endfacet </pre>
SCAD Model	<pre> module pfeife(name,sizename){ if (rad > 39) { color("yellow") writecylinder(name,[0,0,0],t=3,h=9,font="write/Letters.dxf", space=1.2, rad/2+1,hoehe,face="top");} } </pre>
Metamodel in Customizer	<pre> // Radius of the whistle in mm rad = 30; // [20:50] // Height of the whistle in mm hoehe = 20; // [15:30] // Textsize on whistle textsize = 10; // [8:14] // preview[view:south, tilt:top] </pre>





		Model 1	Model 2	Model 3	Model 4
Count Model					
	Constant	-3.82***	-7.18***	-6.60***	-6.58***
Control	Community Experience	5.58***	2.77***	3.01***	1.92***
	Designer Tenure (ln)	0.87***	0.86***	0.37**	0.39**
	Design Availability (ln)	3.66***	3.76***	3.23***	3.23***
	OpenSCAD		5.20***	1.21***	1.24***
	STL		-0.09	0.44*	0.45*
	Both		4.76***	1.41***	1.43***
H1	Customizer			4.50***	4.34***
H2	Customized			-0.12	-0.10
H3	Customizer*Experience				3.25**
	<i>Log(theta)</i>	-3.30***	-2.38***	-1.52***	-1.52***
Zero-Inflation Model					
	Constant	4.67***	1.61	-8.81 .	-10.14
	Community Experience	2.00**	3.56 .	16.27**	17.42*
	Designer Tenure (ln)	-2.32***	-1.12	-3.29**	-3.14**
	Design Availability (ln)	-3.95***	-4.20***	-0.36	-0.87
H2	Customized			13.36**	15.08*
	DF	9	12	15	16
	θ (<i>theta</i>)	0.04	0.09	0.22	0.22
	Log-likelihood	-5,816	-4,834	-4,272	-4,266
	Wald χ^2	341***	2,843***	3,545***	3,392***
	Adjusted pseudo R²	0.06	0.21	0.31	0.31

N=24,173; ***p<0.001; **p<0.01; *p<0.05; . p<0.10



Novices: Ease of use

Experts: Malleable metamodels



*“Have a play with Customizer,
everything goes totally nuts.
I hit a high of 881 views and
30 likes in 1 day,
not intentional, just added customizer
front end on existing design.”*



“Are there stats on how many of the 100,000 are just slightly different useless custom variations of something and how many are actual unique things?”

“The customizer is great, but you really need to adapt the search so that I can remove all the customized things that people put up there. At this point it’s almost useless.”



Search for replication
Search for customization
Search for innovation



Other customizer domains



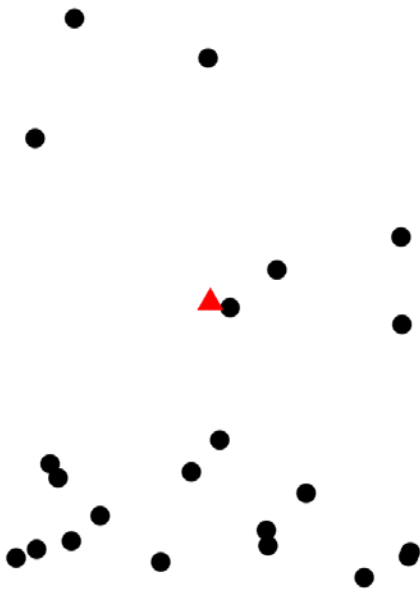
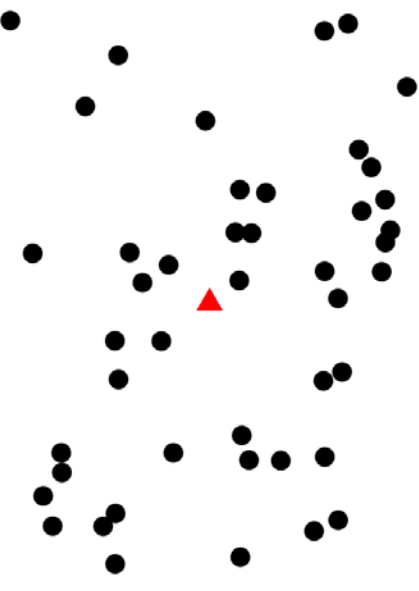


Families of designs, and gravity of designs

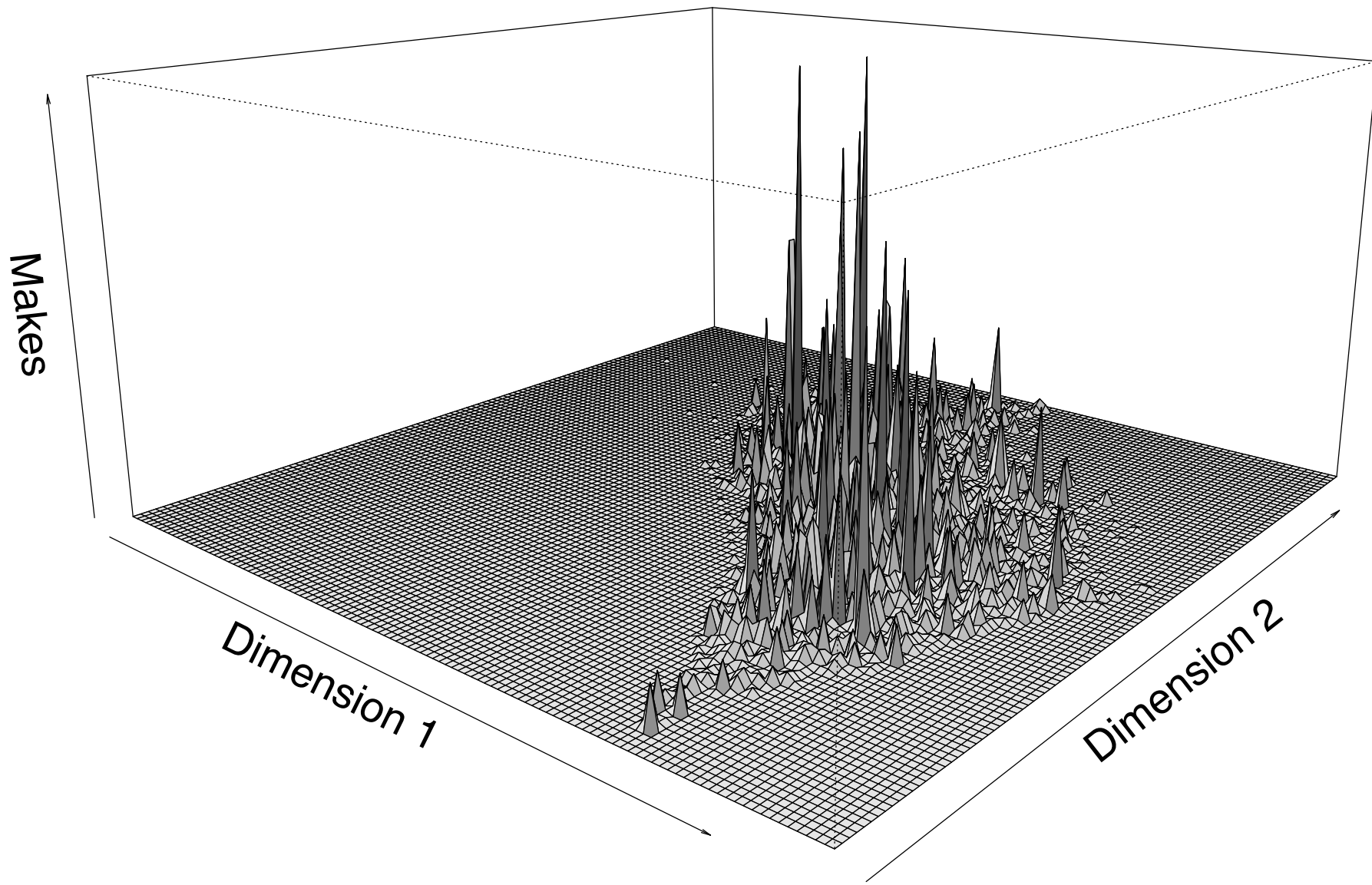
Customizers have attractive pull

Contest seeds have attractive pull

distance and novelty

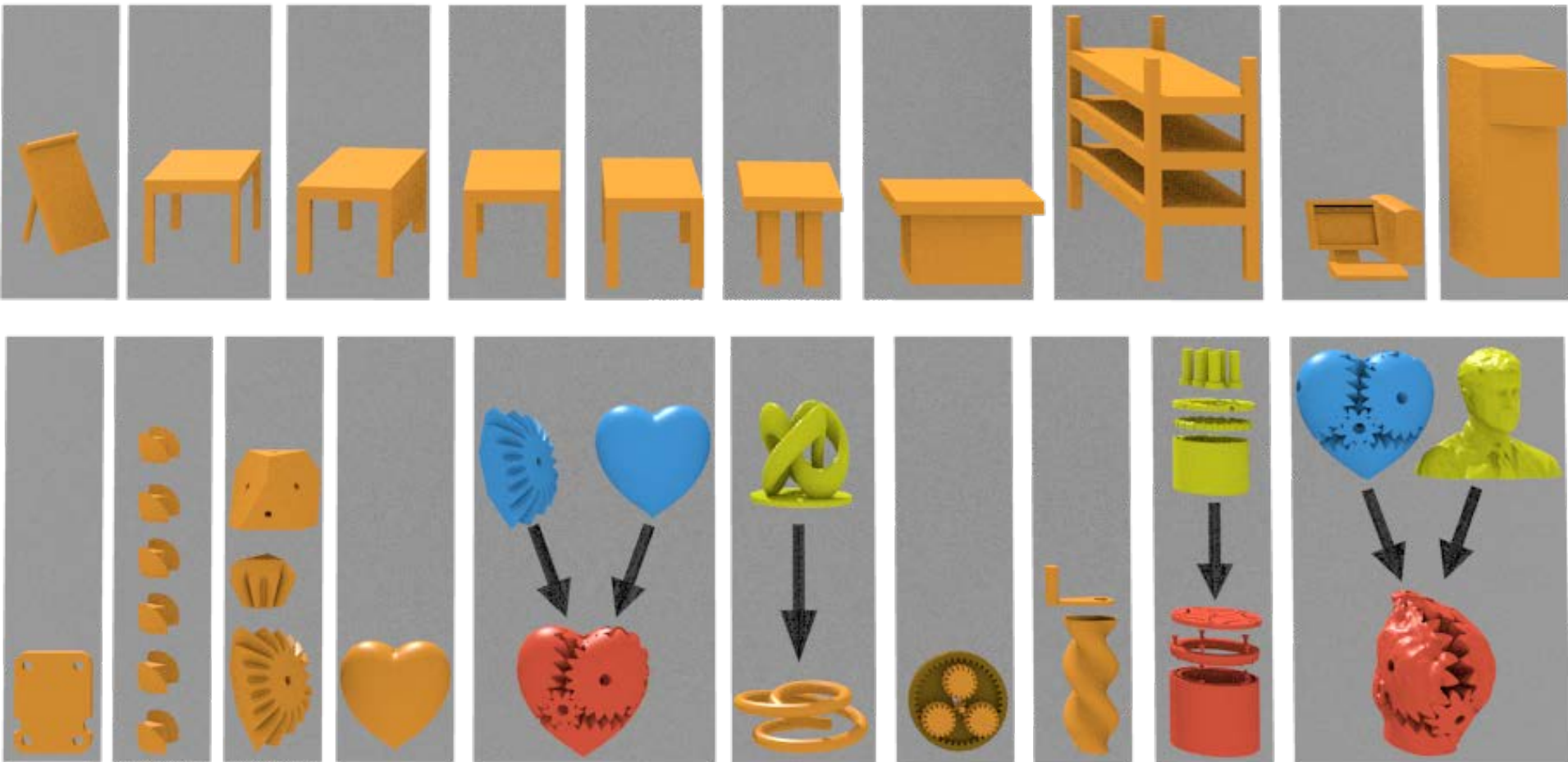


	
	
Beer Bottle	3D Printable Bottle and Screw Cap
Makes	Makes
Likes	Likes
Remixes	Remixes
Downloads	Downloads
Novelty	Novelty
0 6 0 230 0.092	16 256 0 8,129 0.226





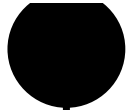
0000000000 vs. 0000110011



- Standalone
- Remix
- Same Creator
- Different Creator



Remixing Sequence



qharley



qharley



qharley



qharley



qharley



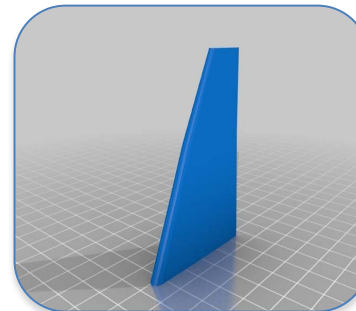
buzz

hoeken

MaskedRetriever

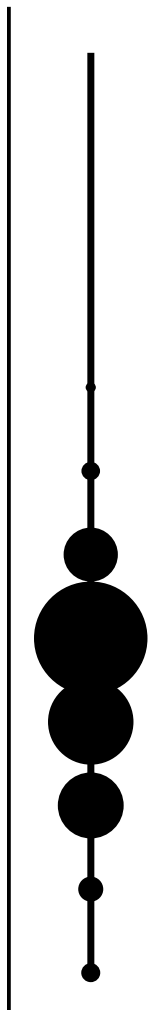


A self starting Vertical Axial Wind Turbine intended for domestic wind harvesting, but could be scaled to any application.



Wings

Remixing Sequence 2



jduanewelch

funkshin

daprice

danlobo

cymon

cymon

watsdesign

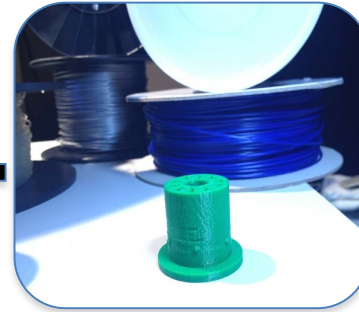
RotoScan

randyy

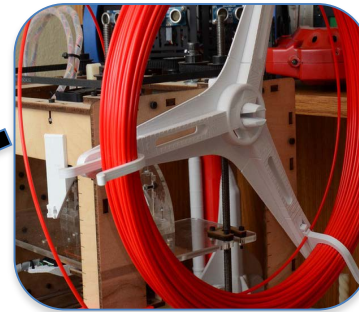
randyy

brokentoaster

camiel



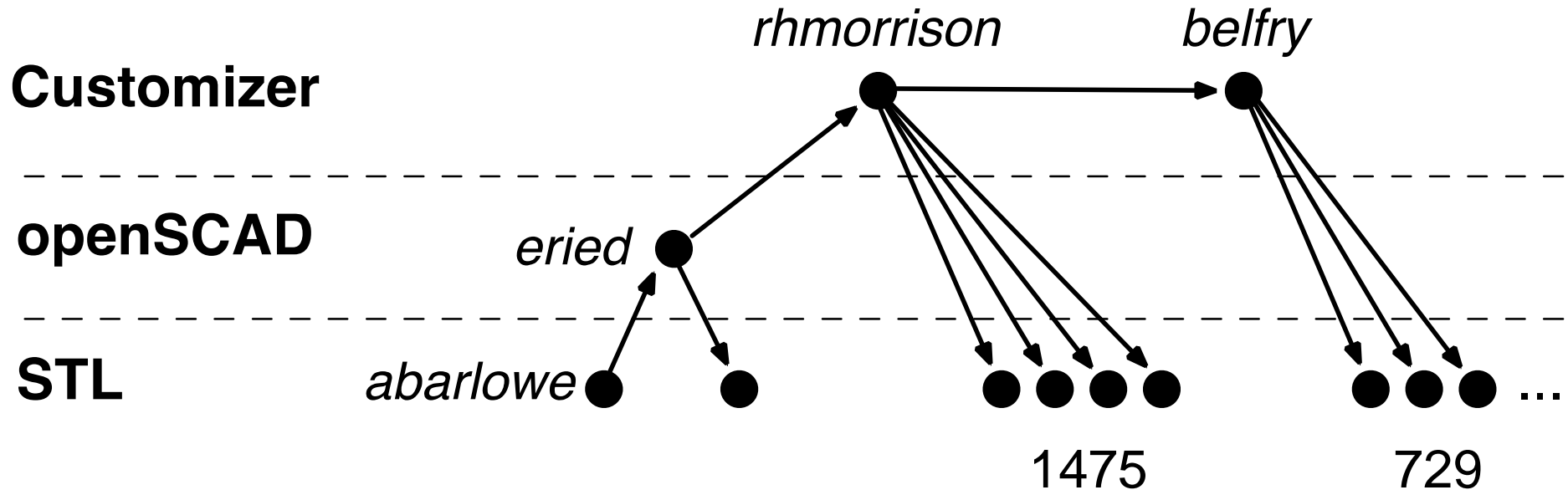
Spool Gear Be



Heavy duty spo



Spool system
for 3D Printer





Do reuse trajectories have natural endpoints?



Compositionality and reuse

collective creativity

