

Open Hardware

Sanli Faez

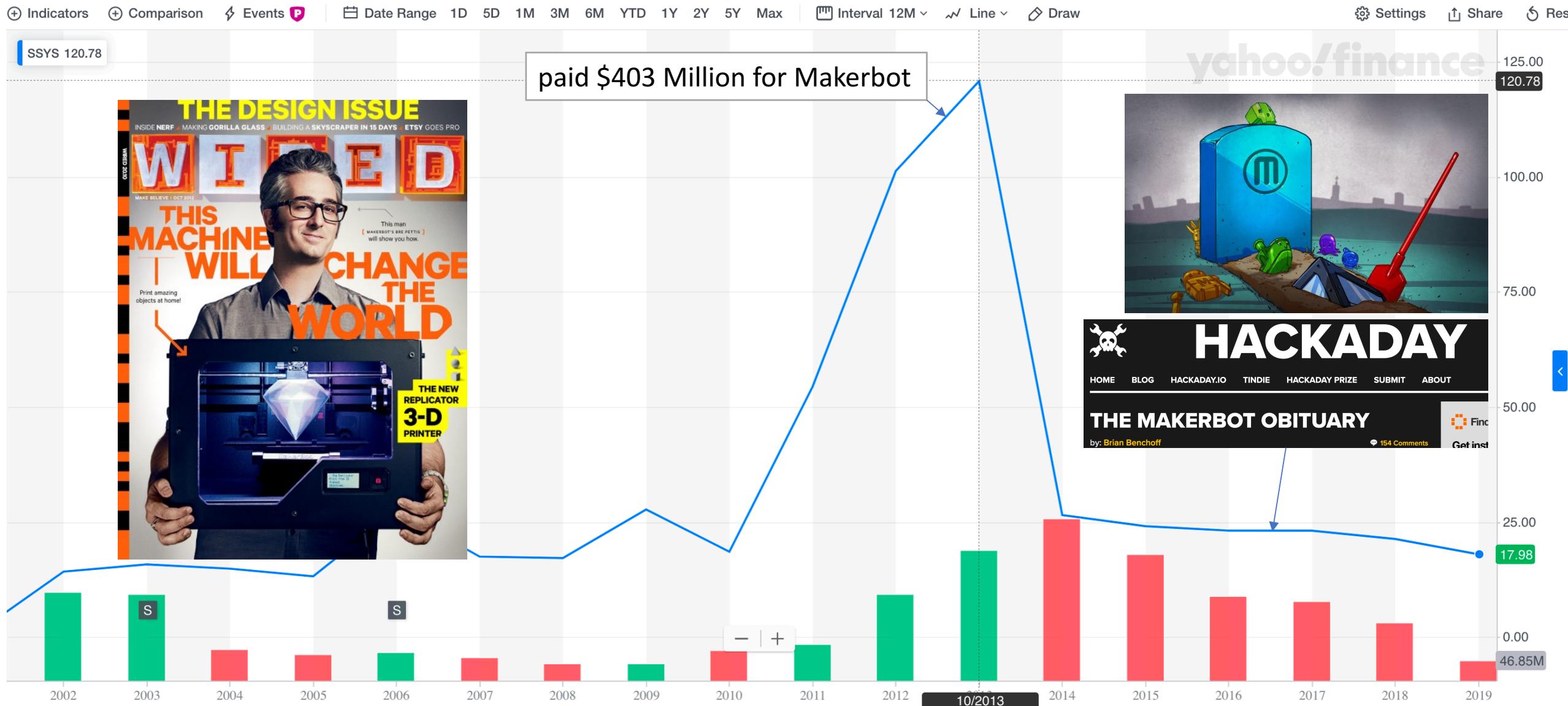
Department of Physics @sanli



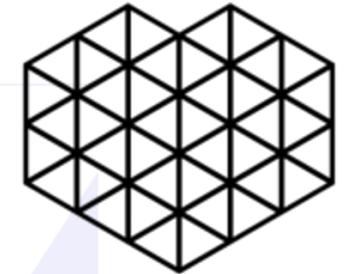
Global Village Construction Set

17.98 -0.90 (-4.77%)

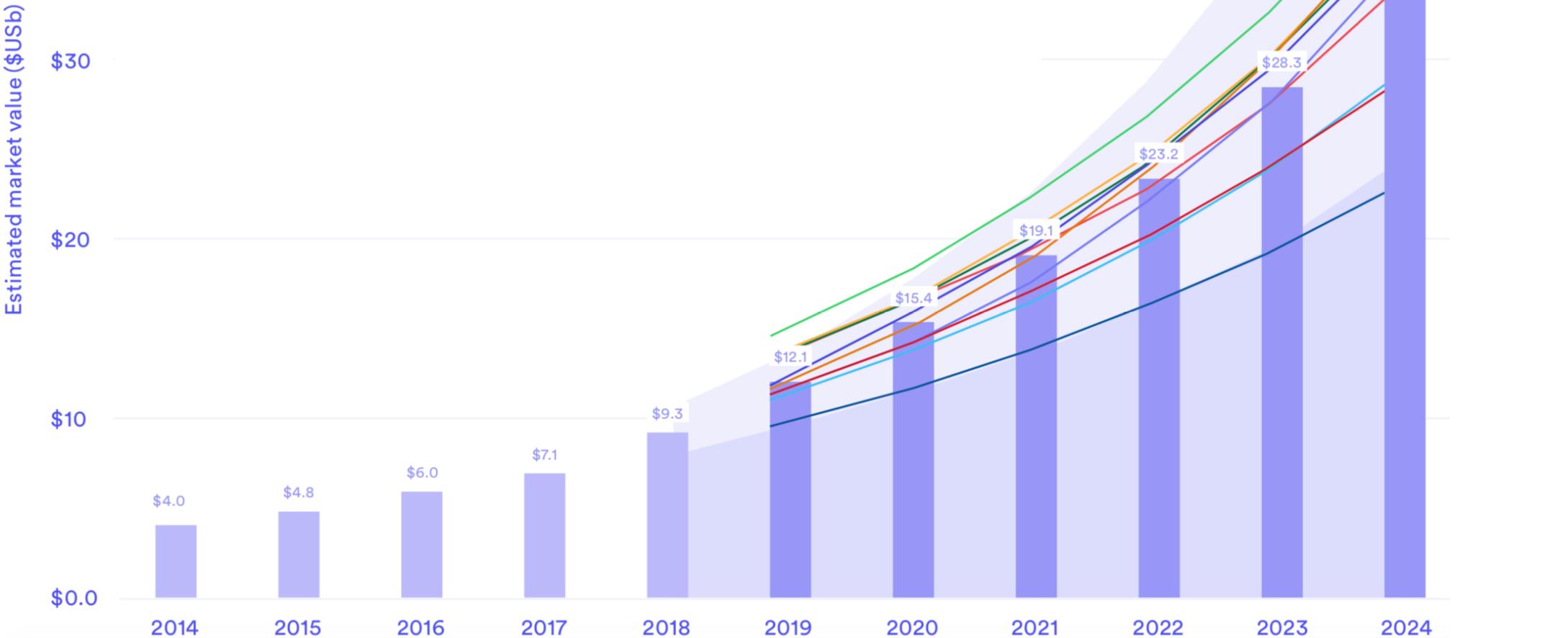
At close: January 31 4:00PM EST



3D Printing market forecast



IN 2019 the total value of 3D printed parts increased by 3-folds. Over 550,000 parts were 3D printed in 3D Hubs' ecosystem alone.



(just like open science)

Open Hardware is About the Community

Egocentric

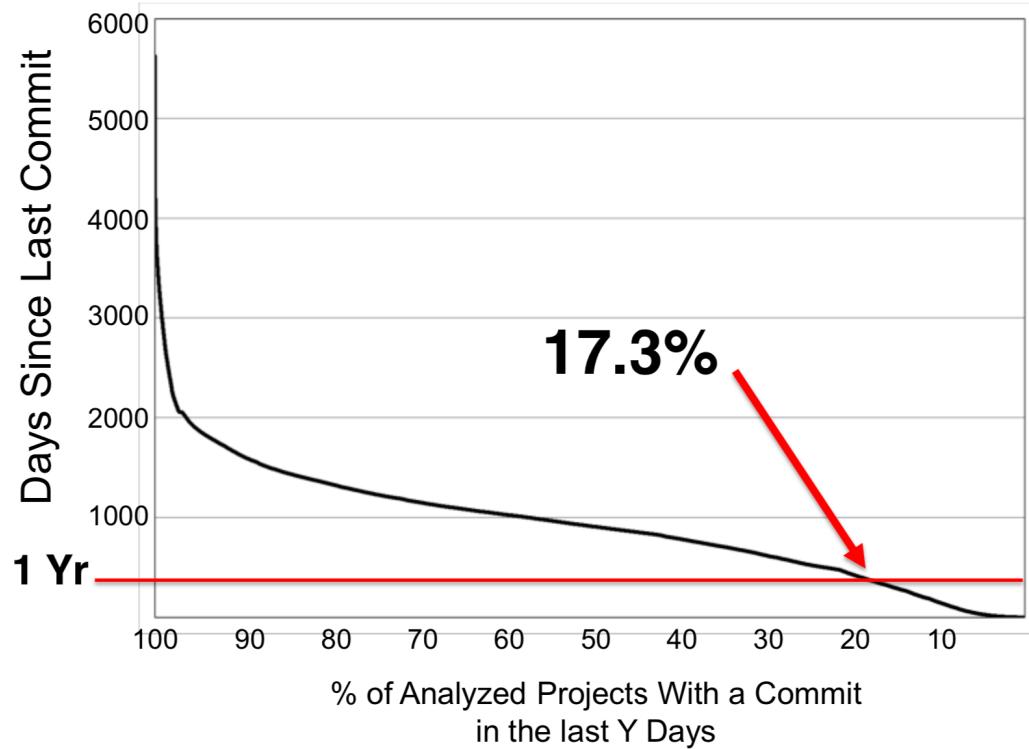


Networked

7 suggestions
& some examples

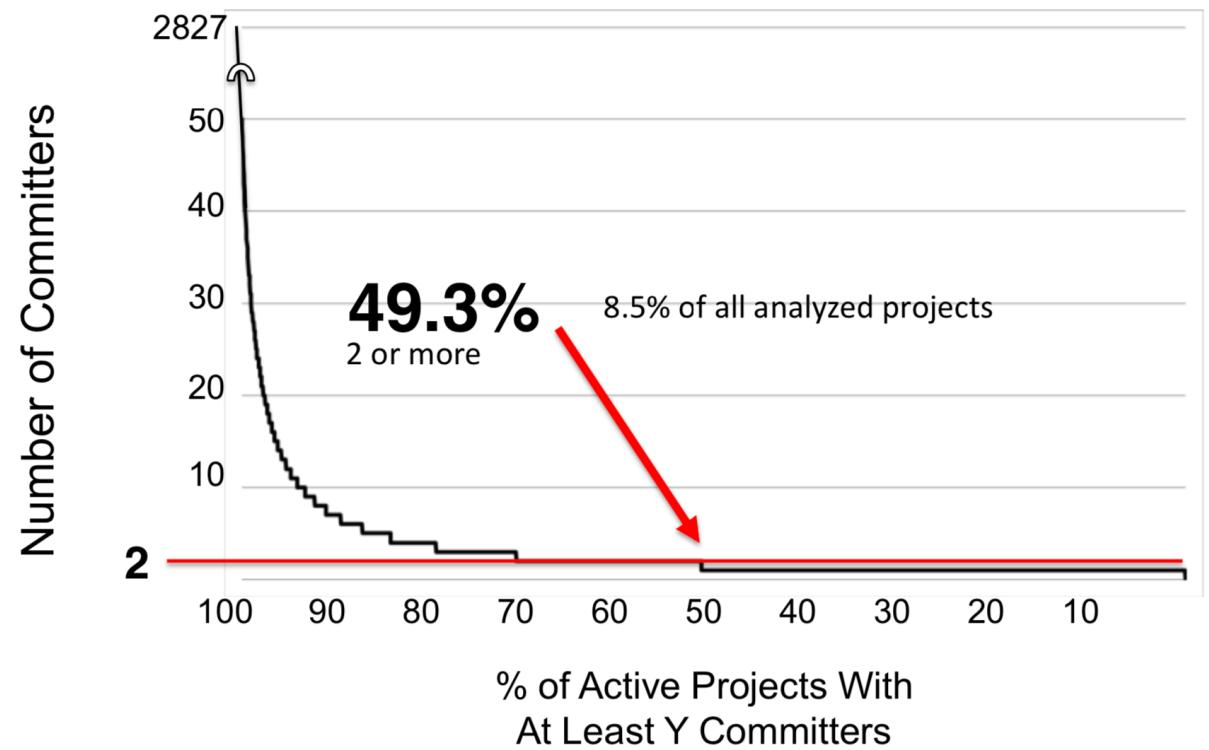
0. Open source ≠ free labor

How Many Projects Are Active?



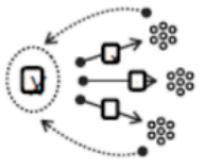
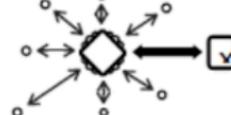
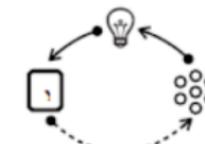
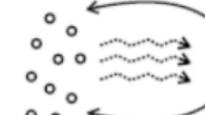
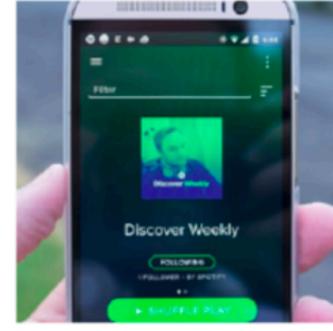
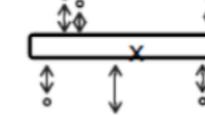
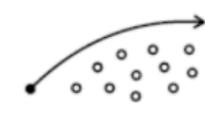
ohloh

But Do All These Projects Have a Team?



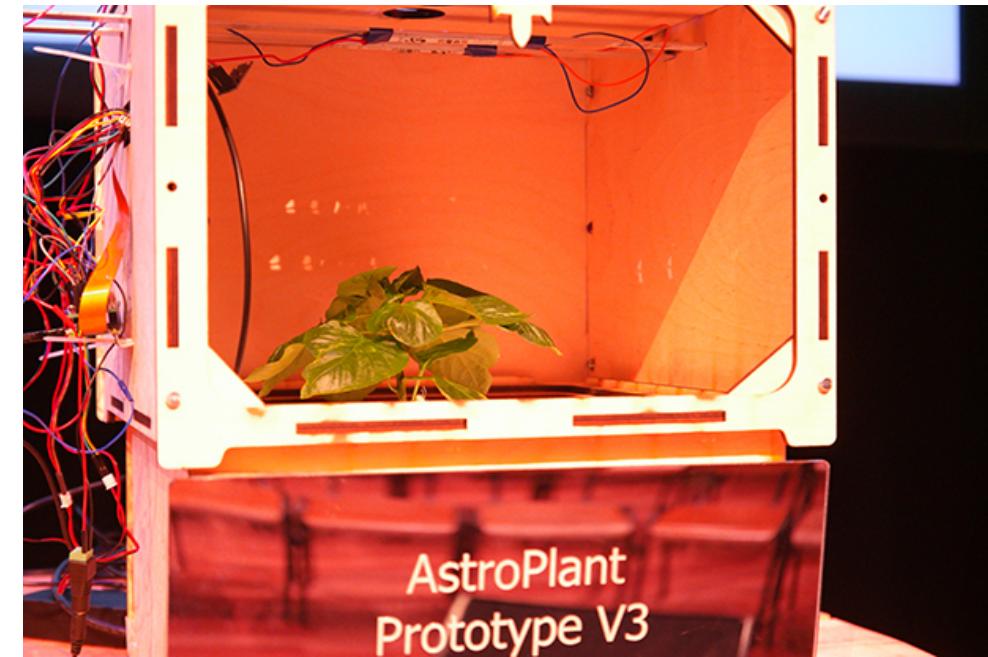
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1. Understand community interactions

Gifting	Creating Together	Soliciting Ideas	Learning Through Use	Enhancing Value Exchange	Networking Common Interests
 <p>No-strings-attached giving of valued products or services</p>  <p>example: Google Android gifted a development platform to encourage new uses by developers</p>	 <p>Sharing the tasks and costs of achieving a pre-established goal</p>  <p>example: Local Motors invites designers to use an on-line shared database of parts to co-develop products</p>	 <p>Using a community to generate ideas and solutions</p>  <p>example: The LEGO Ideas platform allows anyone to propose a kit idea which can be voted into production by all</p>	 <p>Collecting and analyzing activity to improve products or services</p>  <p>example: Spotify Discover Weekly learns user tastes and then creates playlists that users find spot-on.</p>	 <p>Adding value to, or easing exchanges via your technology or service</p>  <p>example: Be My Eyes enables sighted people to remotely 'see' for the blind - and creates insight to sell to 3rd parties</p>	 <p>Coordinating to ensure individual activities achieve more towards a shared mission</p>  <p>example: Ashoka serves as a platform for innovators that share an overall objective - but each set their own projects</p>

1. Understand community interactions

- Agency/empowerment
- Altruism
- Coaching
- Compensation
- Delegation/promotion
- Early access
- Free/discounted access
- Feedback
- In-kind contributions
- Introductions/networking
- Membership/freemium models
- Mentorship
- On-boarding
- Pay it forward
- Professional advice
- Professional development
- Public acknowledgement/recognition
- Reach
- Reputation/social capital
- Resourcing
- Special consideration/opportunities
- Storytelling
- Swag



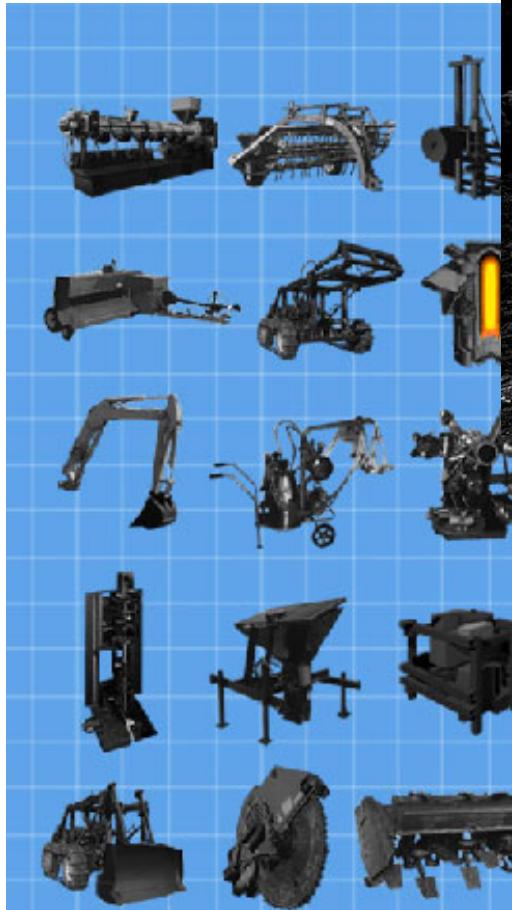
<https://www.astroplant.io/>

2. Have an admirable grand vision



Marcin Jakubowski, Ph.D.

[TED 2011 – Open-sourced
Blueprints for Civilization](#)

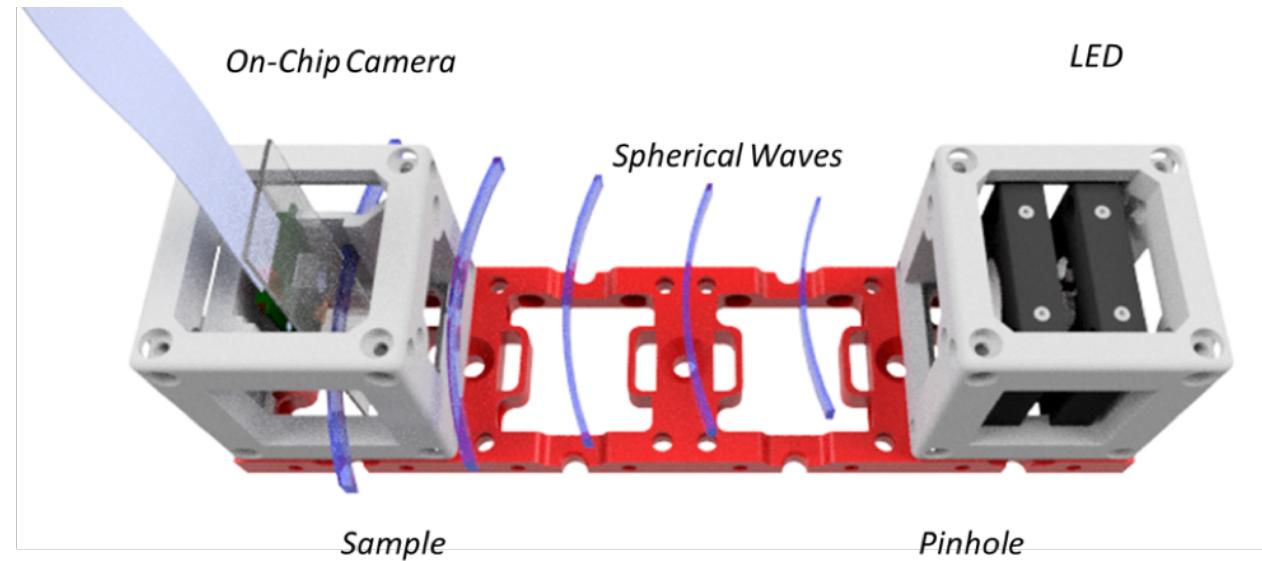


Global Village Construction Set

3. Avoid the tyranny of structurelessness

Jo Freeman's PRINCIPLES OF DEMOCRATIC STRUCTURING

1. Delegation
2. Responsibilities
3. Distribution
4. Rotation
5. Allocation
6. Diffusion of information
7. Equal access to resources

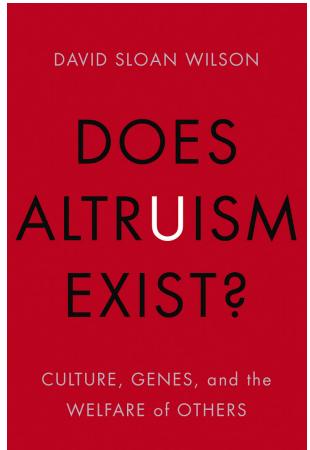


www.useetoo.org

www.jofreeman.com/joreen/tyranny.htm

4. Choose an altruistic team

“Selfishness beats altruism within groups.
Altruistic groups beat selfish groups.
Everything else is commentary”



Does Altruism Exist? Culture, Genes, and the Welfare of Others,
by David Sloan Wilson, Yale UP, 2015



www.opentrons.com

5. You don't have to start from scratch

The Turing Way

1. Introduction
2. Reproducibility
3. Open Research
4. Version Control
5. Collaborating on GitHub/GitLab
6. Credit for reproducible research
7. Research Data Management
8. Reproducible Environments
9. Testing
10. Reviewing
11. Continuous Integration
12. Reproducible Research with Make
13. Risk Assessment
14. BinderHub
15. Glossary

the-turing-way.netlify.com/

Welcome to the Turing Way

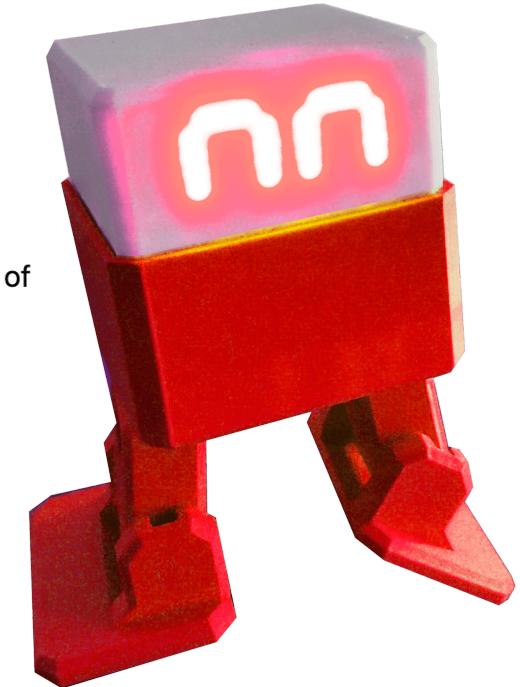
The Turing Way is a lightly opinionated guide to reproducible data science.

Our goal is to provide all the information that researchers need at the start of their projects to ensure that they are easy to reproduce at the end.

This also means making sure PhD students, postdocs, PIs, and funding teams know which parts of the “responsibility of reproducibility” they can affect, and what they should do to nudge data science to being more efficient, effective, and understandable.



The book is collaboratively written and open from the start. If you would like to contribute please [get in touch](#) or visit our [contributing guidelines](#) to learn how to start.



www.ottodiy.com

6. Get in touch with users at an early stage



www.enablingthefuture.org



7. Choose a good motto

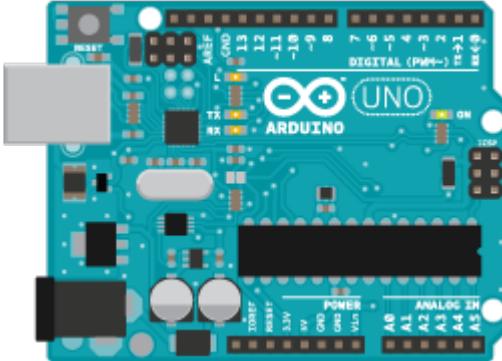


people above projects,
projects above people's stuff



Community over Code

healthy community is a higher priority than good code



So easy,
my granny
can use it

Sharing knowledge to build rich, sustainable lives.



<https://www.appropedia.org/>

7 suggestions

1. Understand community interactions
2. Have an admirable grand vision
3. Avoid the tyranny of structurelessness
4. Choose and altruistic team
5. You don't have to start from scratch
6. Get in touch with users at an early stage
7. Choose a good motto