

Public Trust in Science and Technology

Barriers to building trust

The
Alan Turing
Institute



Recap

Day 4

- Practical Guidance
 - Storytelling with data
 - Choosing the right tools and methods
 - ATTENTION!!!
 - Communicating Uncertainty
 - A Framework
 - Visualising Uncertainty



Overview

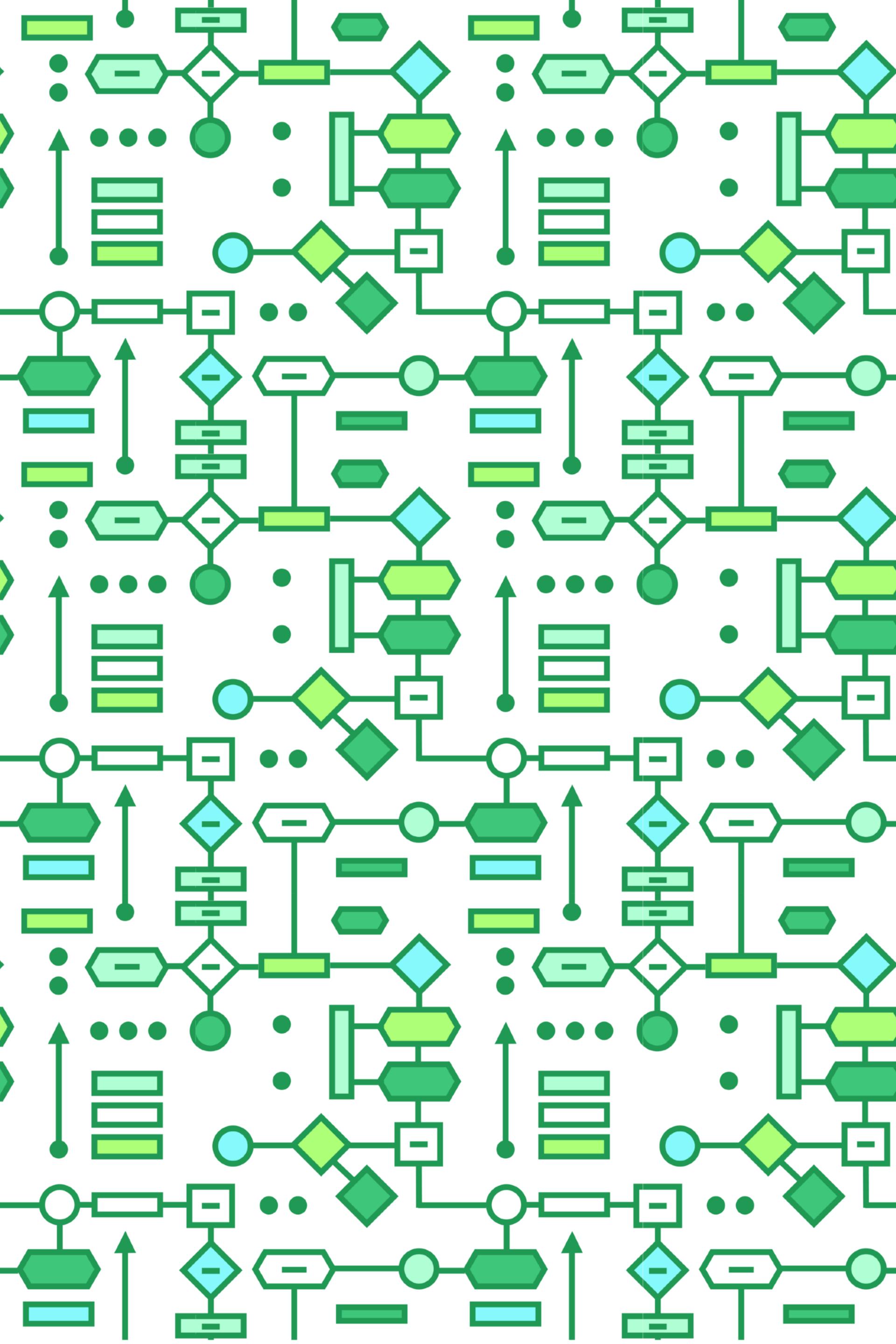
Day 5

- Public Trust in Science
- Discussion
- Finalising case studies



Presentation 1

Public Trust in Science and Technology





Building Trust

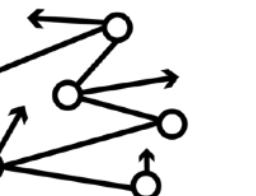
Why does trust matter?

- It provides legitimacy to science and scientists in the public eye.
- It is of help in achieving the practical goals of science (putting science into use).
- Examples of distrust and its effects:
 - Vaccine hesitancy
 - Contact-tracing apps

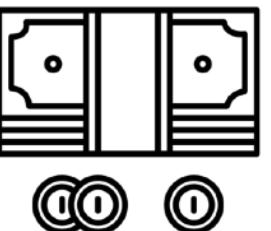
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**Spread of doubt
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**Vested
interests**



Fraud



**Bias and
Over-Hype**



**Discrimination
of marginalised
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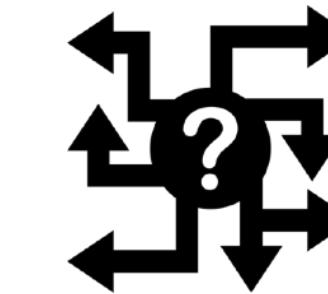
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**Misinformation
and
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**Loss of control
over message**



**Filter bubbles
and echo
chambers**



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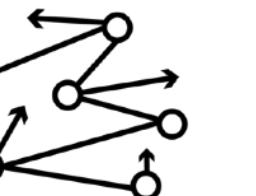


- Scientific literacy.
- Science as a process, not a set of facts.
- Jointly critical and inductive in nature.
- All results are provisional (black swan).
- A lack of understanding in the normal (even crucial) workings of science can then be interpreted as evidence of scientific failure.
- Expert disagreement.

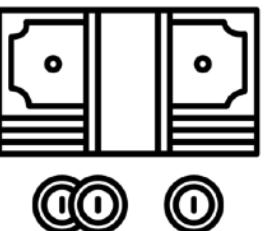
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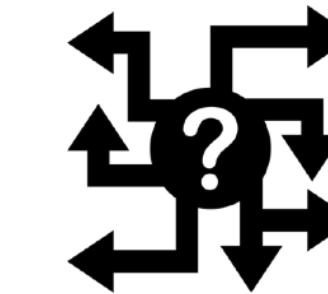
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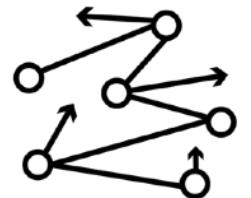
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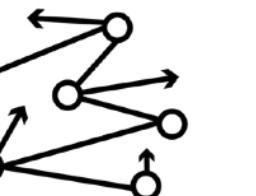


- Inductive and critical nature of science can be exploited to spread doubt and confusion.
- ‘Merchants of doubts’ - examples from tobacco and oil industries.
- Scientific method is used to undermine consensus in science.
- Harm on the public leads to distrust.

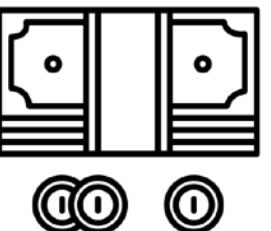
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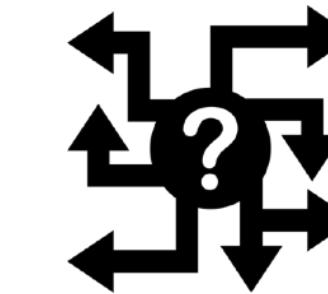
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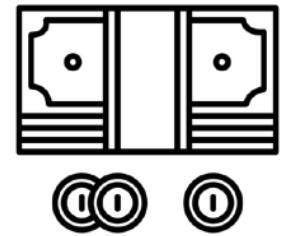
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Vested interests

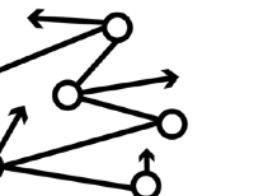


- Scientists might have interests other than understanding the world.
- Often, these incentives are aligned with corporate ones.
- Biased results.
- Research is never published.
- Pharmaceutical industry.
- The ‘Facebook-files’.

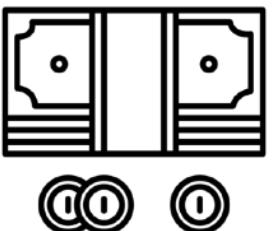
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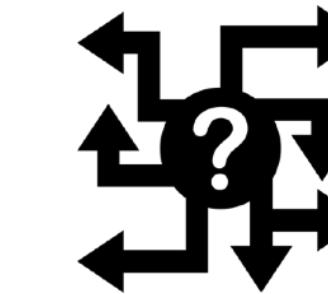
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Fraud



- The world of science is not without fraud and cheating.
- Sometimes prominent scientists are only exposed after they have risen to fame in their fields.
- They can cause a lot of harm, through the application of their fake research, but also by making science less trustworthy.
- Examples:

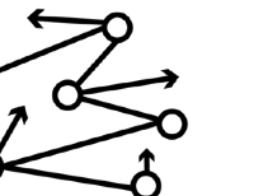
Paolo Macchiarini

Elizabeth Holmes (Theranos)

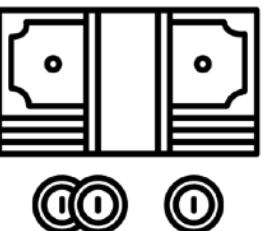
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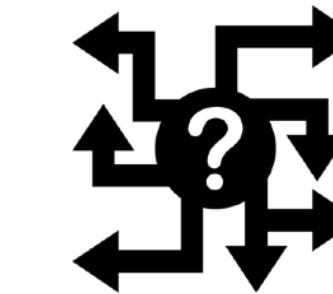
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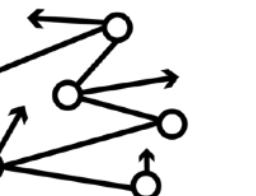


- There are less obvious ways scientists can (consciously or not) skew their results.
 - ‘Publish or perish’ culture can drive bias, carelessness and over-hyping of surprising results.
 - Replication crisis.
 - File-drawer effect.
 - P-hacking.
 - Negligence when checking results.
 - Over-hyping of results.
-
- Cumulative effect of these practices lead to bodies of evidence which are skewed towards novelty and statistically significant effects.

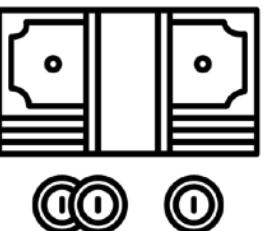
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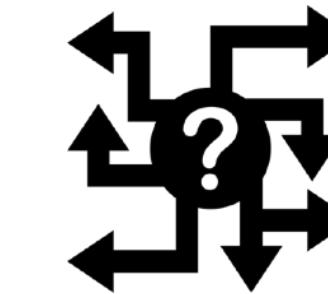
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Discrimination of marginalised groups

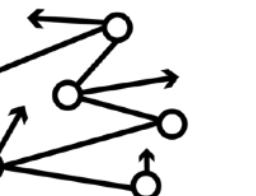


- Science is riddled with cases of sexism and racism, and supposedly “objective” science has been used to perpetuate multiple forms of discrimination.
- Marginalised groups have been mistreated leading to a distrust of science and scientists.
- Examples:
 - Racism in US healthcare
 - COMPAS
 - Amazon’s hiring algorithm

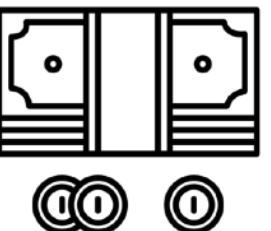
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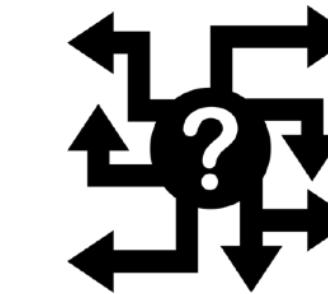
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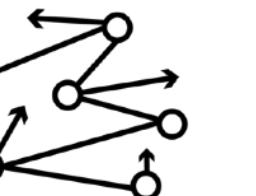


- Researchers can also abuse their power and violate the trust the public has given them.
- Asymmetry of information between researchers and the general population.
- Facebook emotional contagion study.

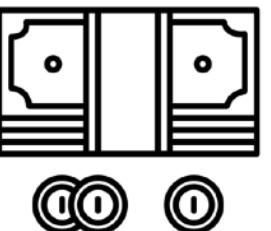
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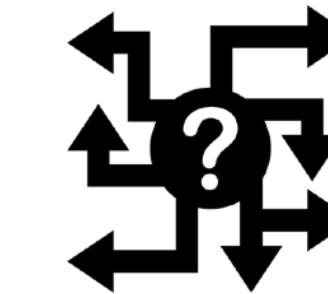
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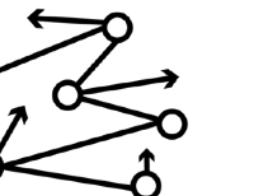


- The spread of misinformation and disinformation about science can:
 - Confuse people about what scientists are saying,
 - Make people distrust scientists' motivations,
 - Create distorted narratives about the current state of scientific evidence.
- The pandemic has given us (too) many examples of this!
- Fake news spreads faster than real news online, and is a lot more likely to be retweeted.
- Social media and algorithms that spread attention-grabbing content.

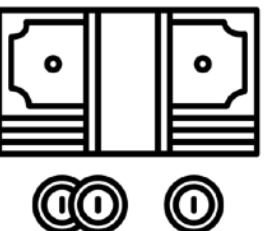
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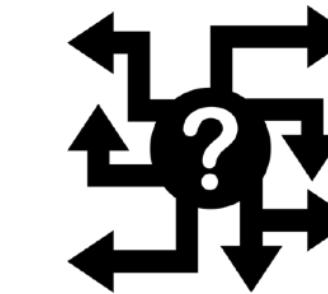
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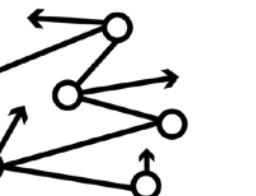


- Even if scientists work very hard to become trustworthy, they are still not completely in charge of their message.
- Research results can be reported to varying degrees of accuracy in the press and in social media.
- Click-bait in science reporting.
- Reporting on the pandemic.
- Highlights the importance of public engagement.

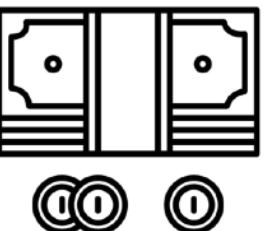
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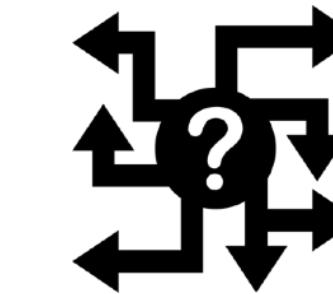
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Filter bubbles and echo chambers

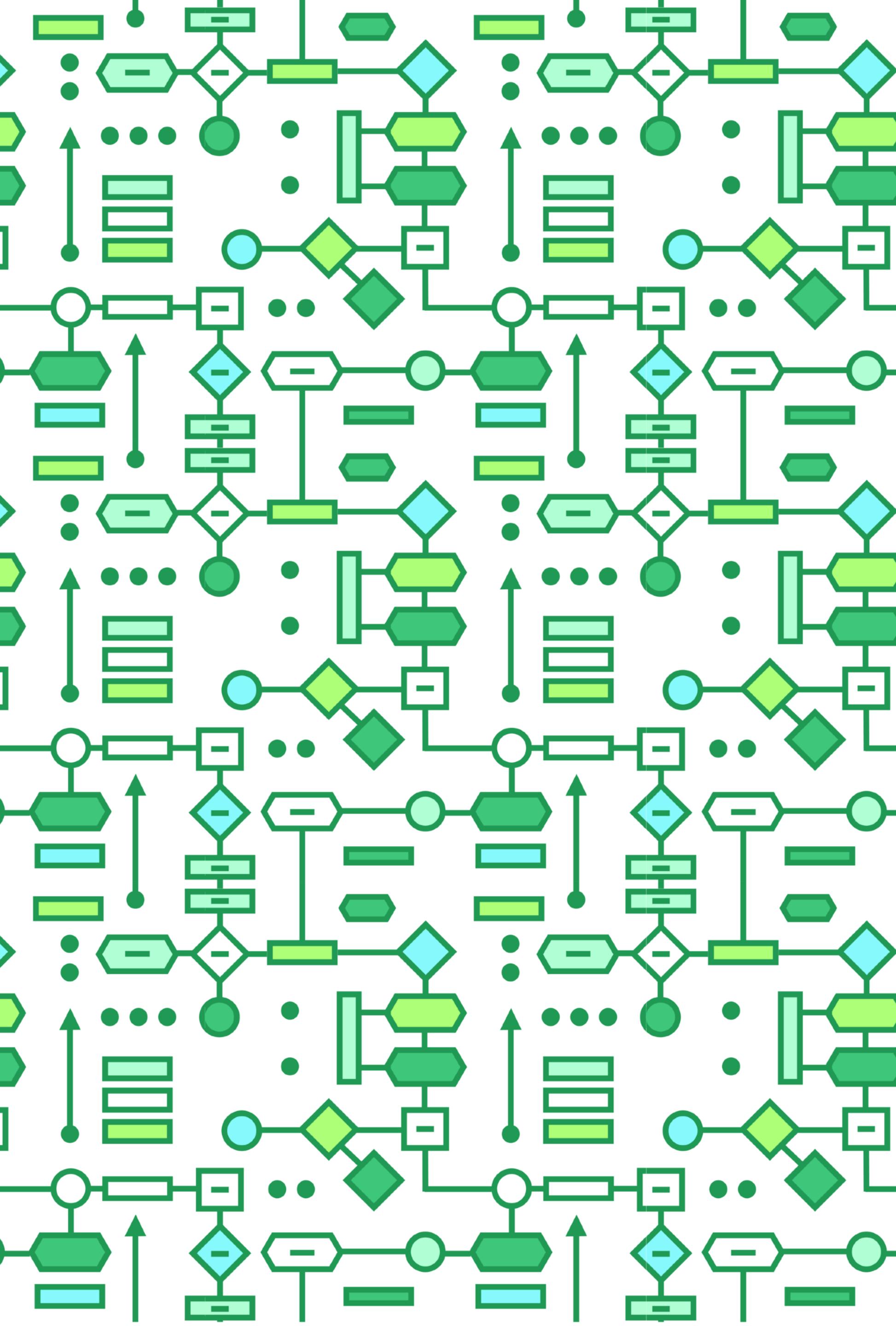


- Not exclusive to social media platforms, but certainly amplified by them.
 - Filter bubbles.
 - Personalisation algorithms.
 - Echo chambers.
 - Post truth and the power of echo chambers.
 - Importance of trust in belief formation.

Break

Activity 1

Discussion



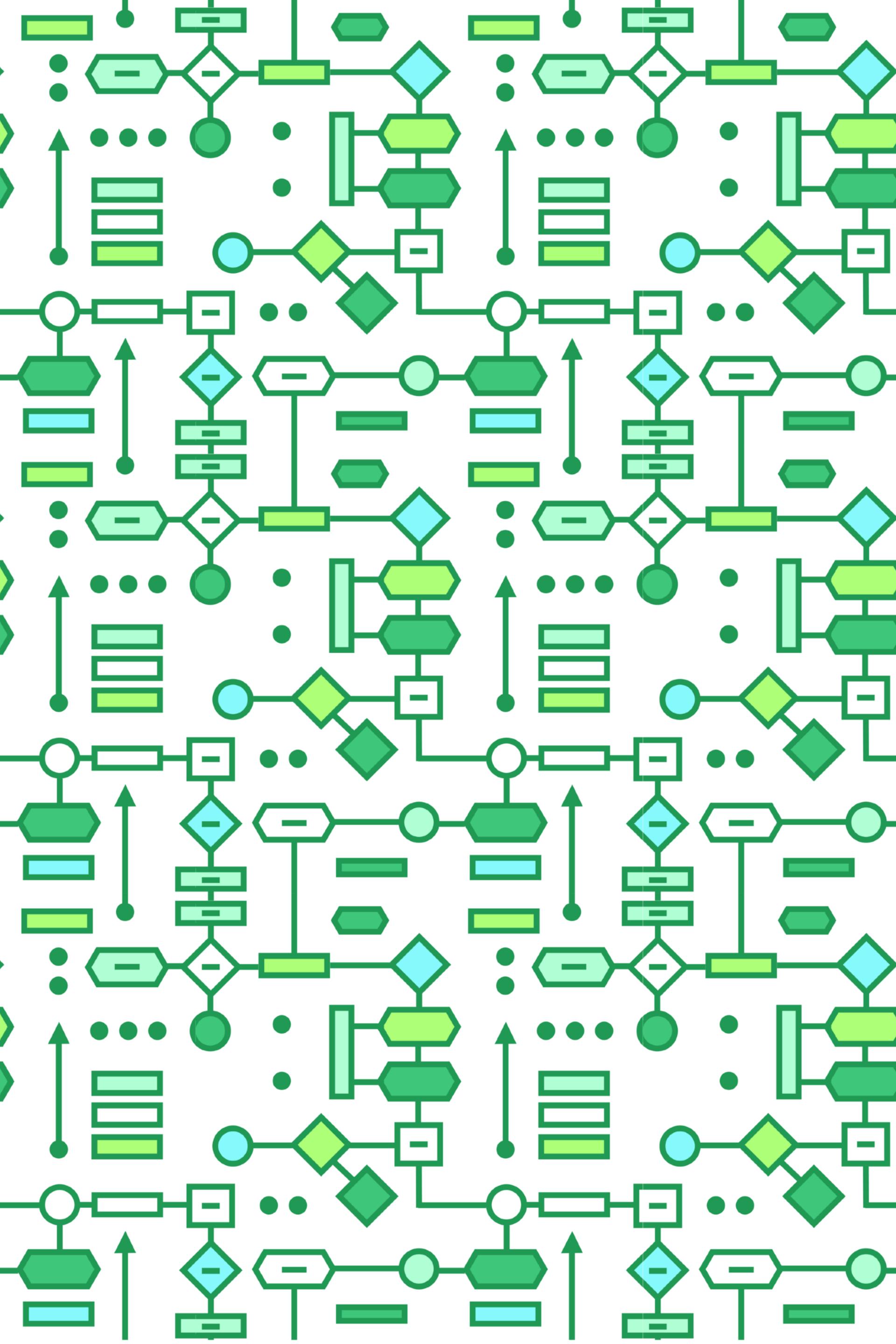
Questions

Topics for Discussion

1. Can you think of examples of these challenges from your own field of research?
2. Can you think of an instance where your own trust in science increased or decreased? What factors drove the change in trust?
3. Do you have advice, from your own experience, of things that work well for addressing any of these challenges?
4. Can you propose a (partial) solution to any of the previous challenges?
5. How much responsibility do you feel you have for overcoming these challenges?



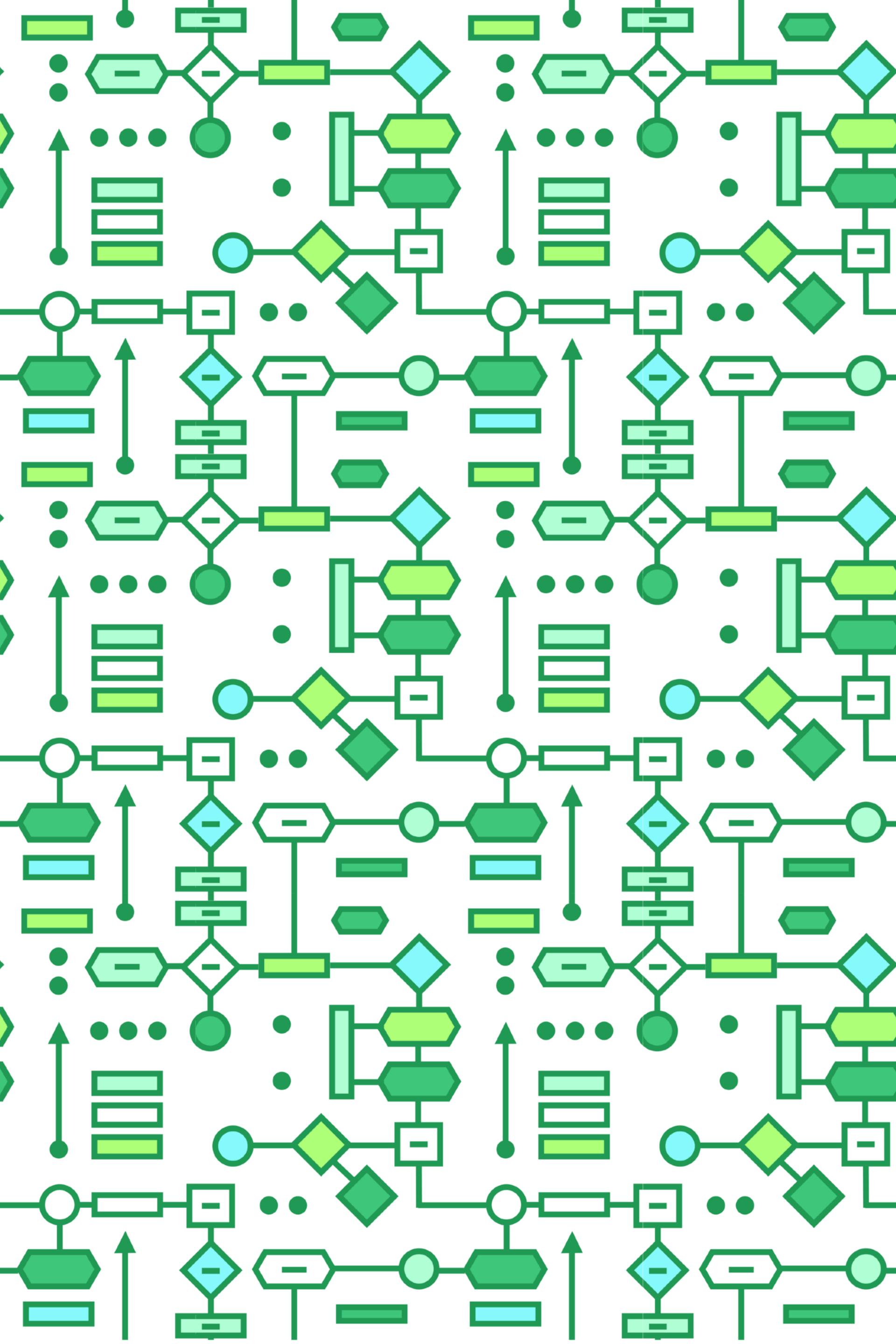
Activity 2 Illustrations



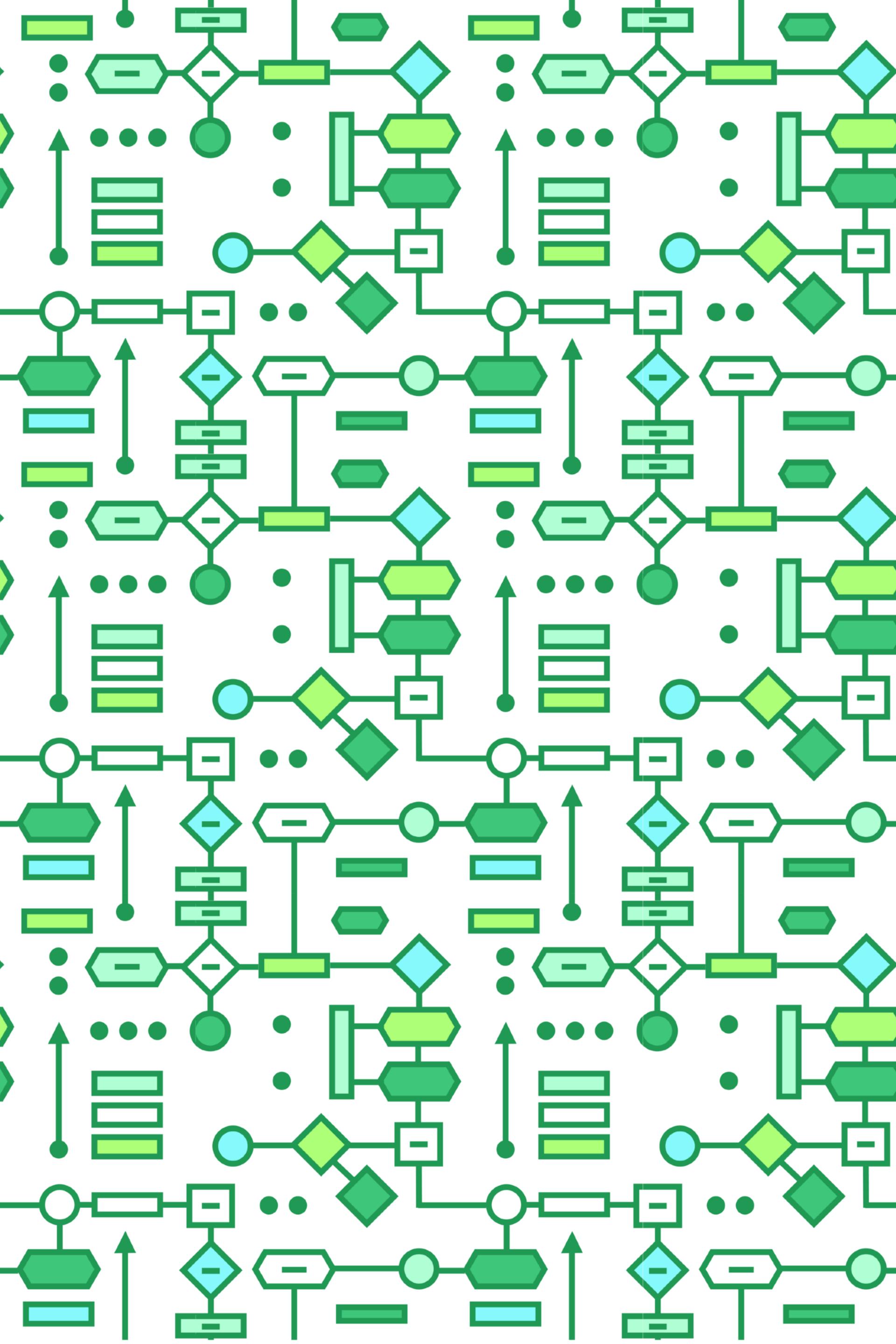
Lunch

Activity 3

Finalising Case Studies



Activity 4 Showcase



Wrap-up

Further Resources

- Turing Commons website
 - RRI guidebook
 - PED guidebook
 - AEG guidebook
- GitHub repository
- Online courses



Thank you!

Please stay in touch