

# GRACE HOPPER CELEBRATION



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Embedding Social Responsibility and Ethics  
into the Engineering Lifecycle

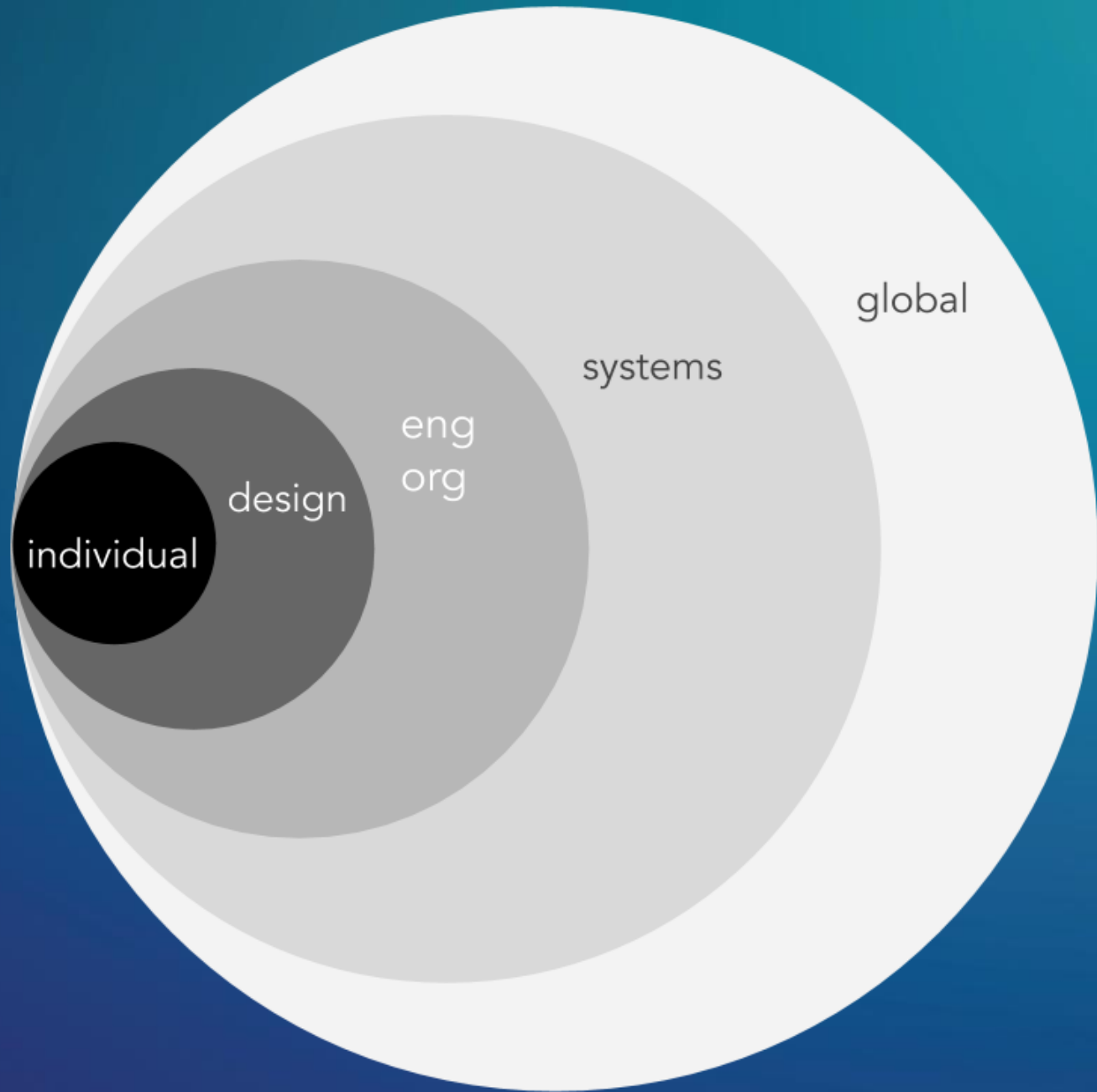
#GHC19

# Embedding Social Responsibility and Ethics into the Engineering Lifecycle

Social responsibility and ethics are present at every level of technology and society. From the micro-level of the individual and the decisions they make, up through organizations, education, and our global society, each layer has its own unique and interconnected considerations. Today we will speak to each of these perspectives.

What brought you to this session today?





# Hallie Benjamin

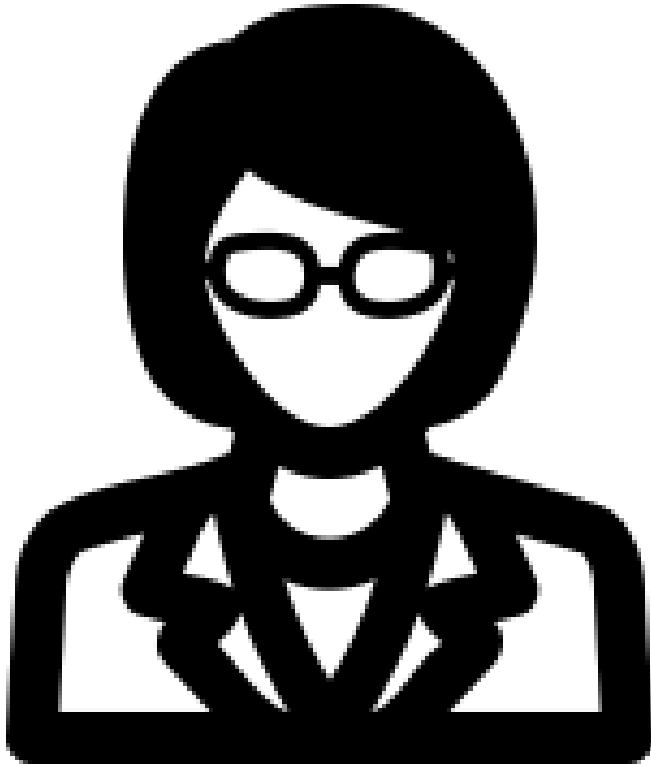
Founder, f[AI]r Startups  
Program Lead, Google AI

@halliemax



A black and white photograph of a person's profile, wearing large over-ear headphones, looking out of a car window. The person's hand is resting near their chin. The view outside the window is a heavily blurred forest or wooded area. The text "The Individual" is overlaid in white on the right side of the image.

# The Individual



**IS THIS MY JOB?**

**WHAT'S MY RESPONSIBILITY?**

**HOW CAN I DO THIS ALONE?**

**.... AND WHERE DO I  
EVEN START?**



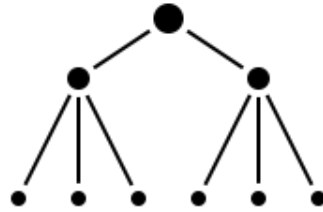
# What is issue spotting?



# Issue Spotting Roadmap



Product  
Concept



Data &  
Model Specs

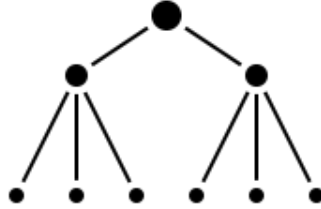


Design &  
UI/ UX

# Issue Spotting Approaches



- Vertical / Topic area
- Known problems for this industry
- Metrics



- Biases reflected in data and source selection
- Failure modes for this ML domain
- Human/rater bias



- Potentially exclusive design
- Real user feedback
- Test your assumptions



# Sarah Hubbard

Program Manager, Azure IoT, Microsoft

@sarahhubba



# The Product Lead



# Evolution of our products and organizations

This is an evolution driven by digital transformation, which spurs new social responsibilities and ethics to consider in the engineering lifecycle.



41.6B

projected IoT  
devices connected  
by 2025

<https://www.zdnet.com/article/iot-devices-to-generate-79-4zb-of-data-in-2025-says-idc/>



70%

of businesses already  
have a digital  
transformation strategy in  
place or are working on  
one

<https://www.ptc.com/en/product-lifecycle-report/digital-transformation-statistics>



84%

of organizations have  
experienced an IoT-related  
security breach

<https://ipropertymanagement.com/iot-statistics>

# Example: Toys that Listen

ACM link here: <https://dl.acm.org/citation.cfm?id=3025735>

General interaction: How do parents and children interact with Internet-connected toys? What are their expectations and mental models for these interactions?

Privacy: What are the privacy expectations and concerns of parents for connected toys? What are children's mental models of their privacy when interacting with the toy?

Parental controls: What parental controls do parents wish to exercise?





# Example: Toys that Listen

## Recommendations:

1. Visual indicators
2. Evaluate recording and storing data, local processing
3. Important that the toys have flexible interactions and integrated instructions
4. Educate consumers
5. Enforcing existing regulation (COPPA)
6. Evaluate non-toy products

It's critical to design for our unintended users, who are very often our most vulnerable populations.



**Figure 1.** Example connected toys: (a) CogniToys Dino, (b) Hello Barbie, (c) SmartToy Monkey, (d) My friend Cayla, (e) TROBO the Story-telling Robot, (f) Jibo. Our study involved (a) and (b).



**Figure 5.** KidSafe certification seal.



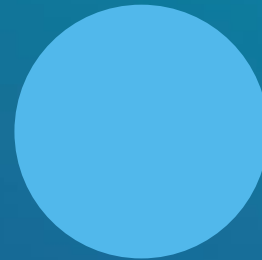


# Design and product principles in digital transformation



## Data strategy

How data is managed, collected, and accessed. Data minimization/deletion policies. GDPR.



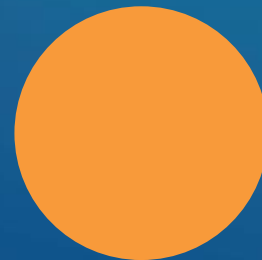
## Privacy by design

Proactively designing a product and system that accounts for privacy, security, accountability, and reliability.



## Customer expectations

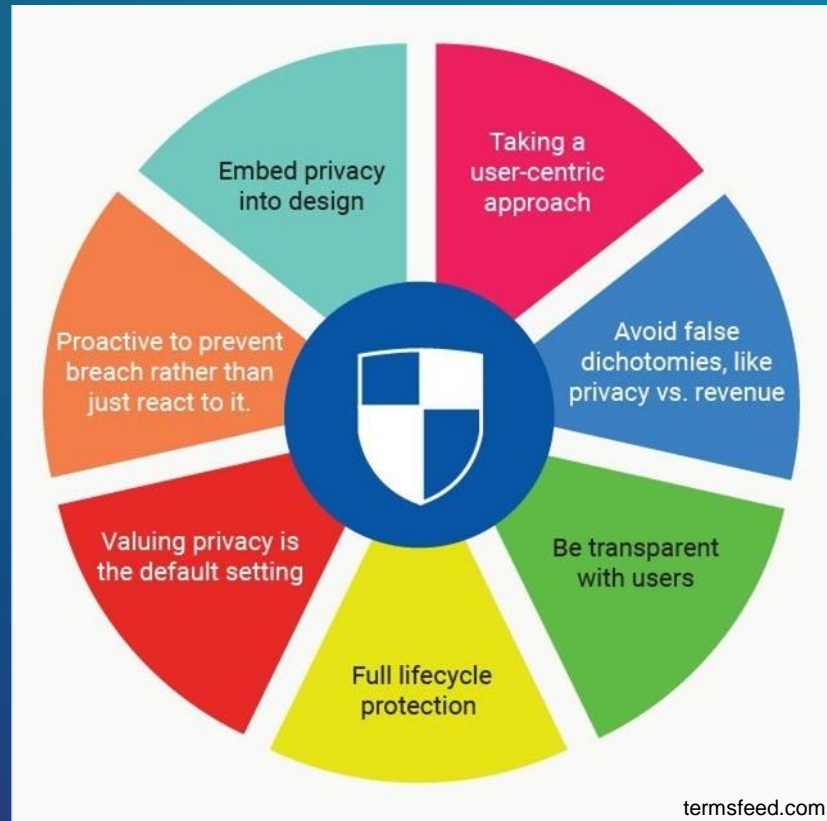
Transparency and consent to build trust with customers. Value-driven organization.



## Developing the organization

Developing specialized talent and teams, as well as providing resources for training on the latest best practices, industry standards etc. Ethics review board.

# Design and product principles in digital transformation



# Amanda Casari

Engineering Manager, Google Cloud

@amcasari



A black and white photograph showing a large number of hands stacked in a circular pattern, reaching towards the center. Many of the wrists are wearing black wristbands with the word 'EMFASIS' printed on them in white. The hands are of various skin tones and some have rings. The background is dark and out of focus. The overall mood is one of unity and teamwork.

# The Engineering Team

“For ***organizations seeking guidance on how to improve***, we point to the only real path forward:

***Start with foundations***, and then adopt a ***continuous improvement mindset*** by ***identifying your unique constraint*** (or set of constraints). Once those constraints no longer hold you back, ***repeat the process.***”

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Accelerate: State of DevOps 2019, [DORA](#)

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@amcasari



# Foundation: *Your* Technical Stack

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## THE DATA SCIENCE **HIERARCHY OF NEEDS**

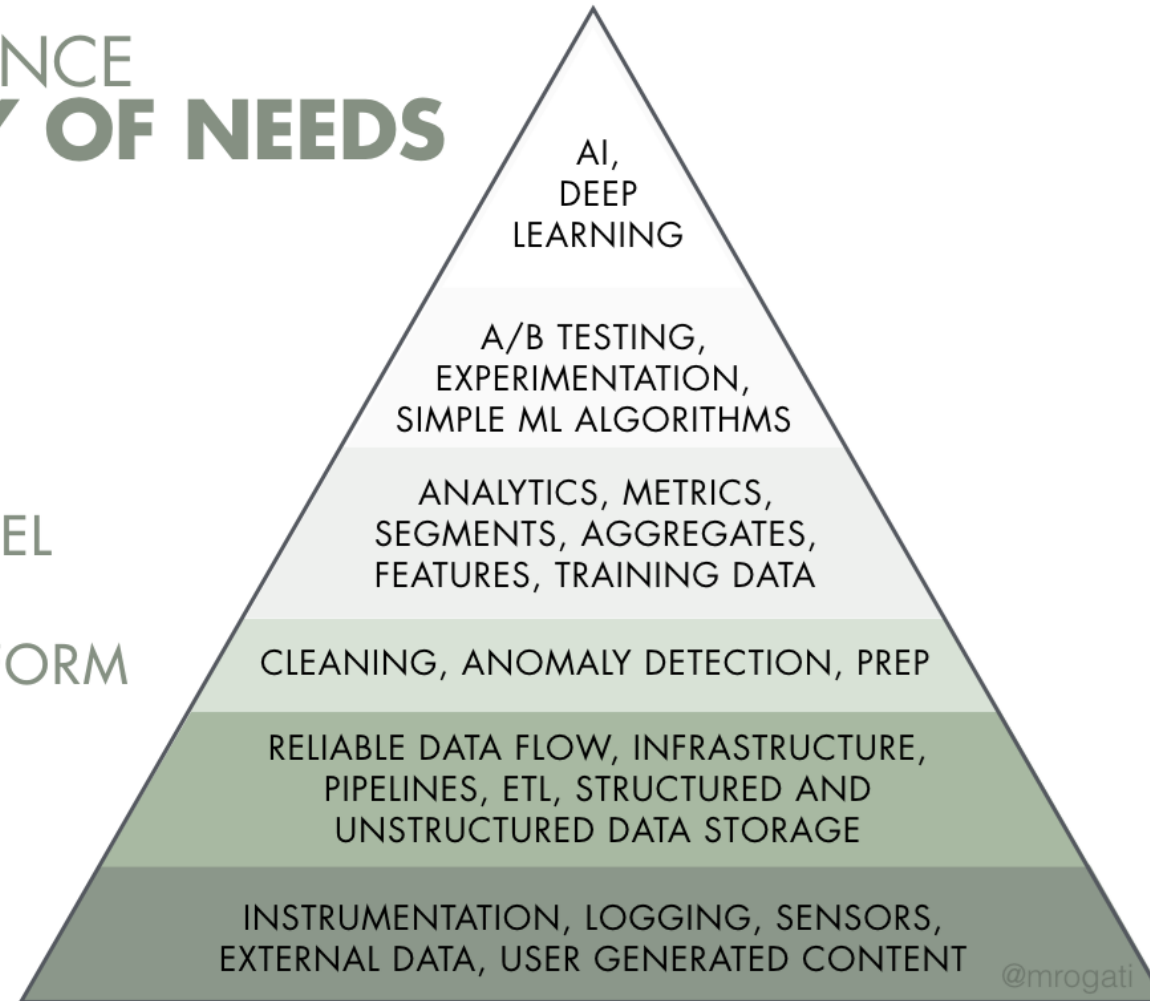
LEARN/OPTIMIZE

AGGREGATE/LABEL

EXPLORE/TRANSFORM

MOVE/STORE

COLLECT

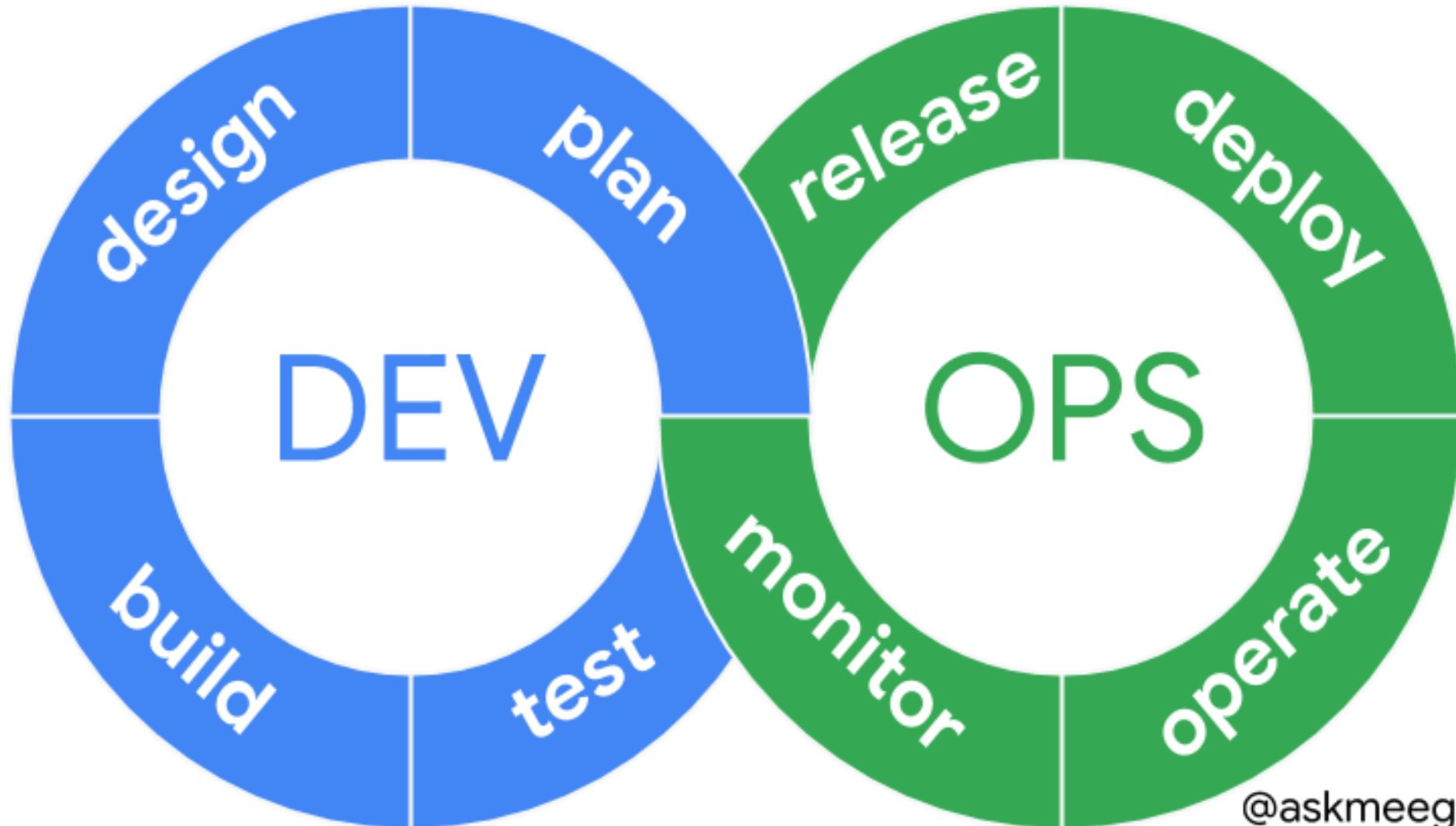


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# Foundation: *Your* Path to Production

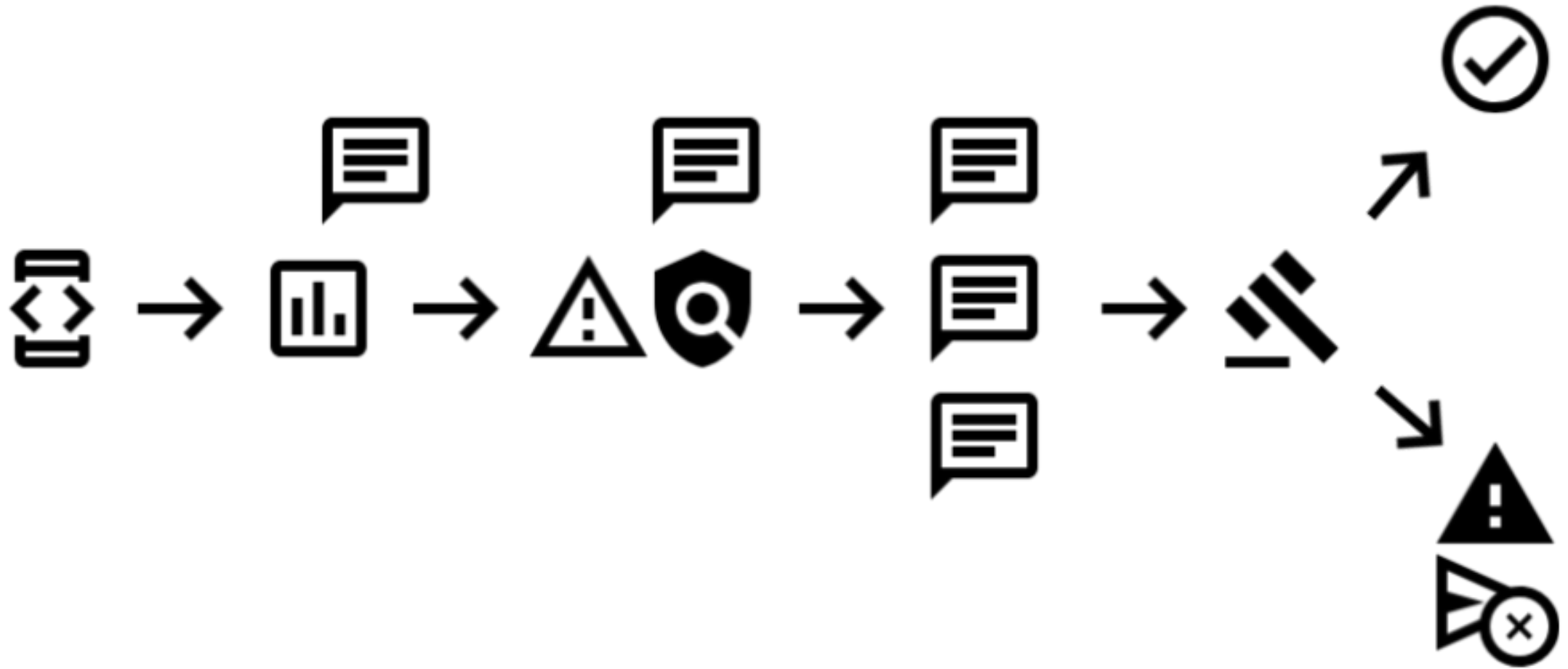
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@askmeegs #ghc19  
@amcasari

# Foundation: *Your* Risk Assessment Process

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# Foundation: *Your* Development Tools

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- [Tensorflow Privacy](#) - differential privacy for training data
- [Tensorflow Federated](#) - library for machine learning on decentralized data
- [What If? tool for Tensorboard](#) - model examination through visual inspection ([paper](#))
- [Model Cards for Model Reporting](#), 2018, M. Mitchell, et al
- [deon](#) - Python package addings ethics checklists for data science projects

## *put your principles into action*

Look for open source projects where **a single update will ripple** throughout the industry.

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**pip install change-at-scale**

# Kathy Pham

Responsible Computer Science, Harvard and Mozilla  
Founding Member United States Digital Service  
[@kathytpham](#)





# Honor Expertise

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ENG vs. NON-ENG

SOFTWARE ENG vs. SUPPORT



ENG vs. NON-ENG

SOFTWARE ENG vs. SUPPORT

# A few to get started

computer science +

anthropology

critical race and gender studies

data science

design

history

human rights studies

law

philosophy

political science

science technology & society studies

sociology science





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# Airbnb's Work to Fight Discrimination and Build Inclusion

Airbnb worked closely with Laura Murphy, American Civil Liberties Union, and talked to people:

- Hosts
- Victims of Discrimination
- Employees
- Civil Rights Organizations
- Federal and State Regulatory Agencies
- Elected and Appointed Officials
- Travel and Tourism Executives

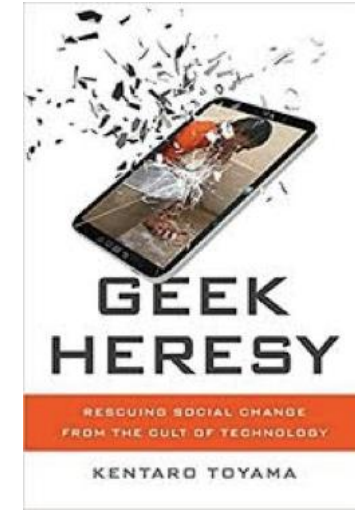
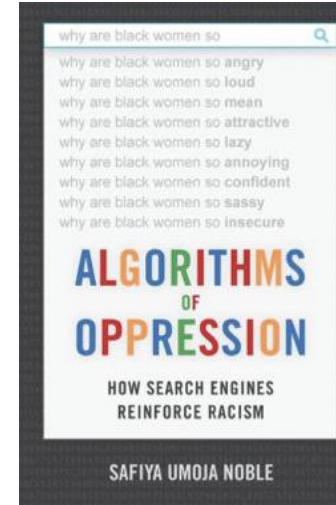
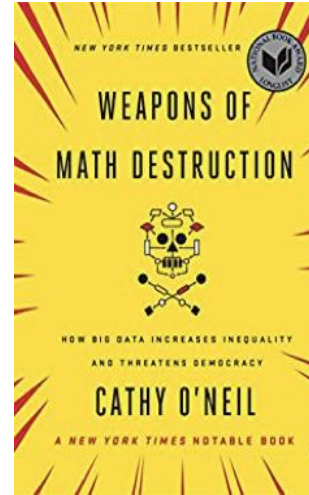
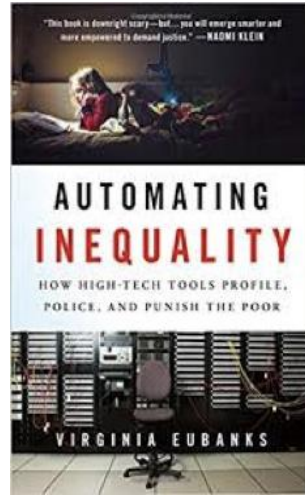
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# Airbnb's Work to Fight Discrimination and Build Inclusion

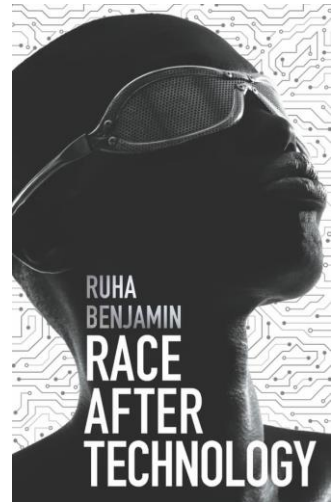
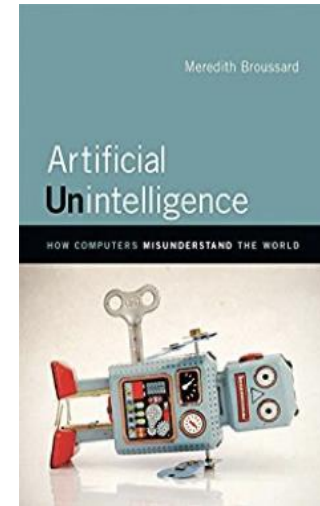
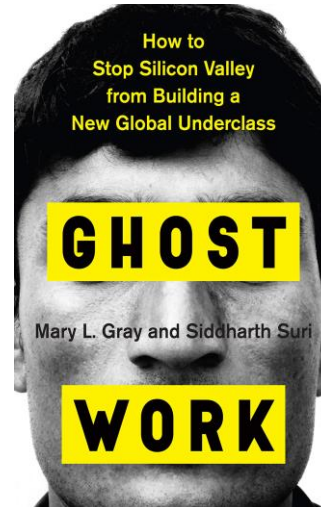
They made some changes:

- **Encouraging the Growth of Instant Book Listings**
- **A Permanent, Full-Time Product Team to Fight Bias and Promote Diversity**
- The Airbnb Community Commitment
- A New Nondiscrimination Policy
- Going Beyond Photos
- Enforcing the Rules, Supporting Our Community
- Open Doors
- Welcome to Our Home: Addressing Unconscious Bias and Bringing People Together
- A Diverse Workforce, A Diverse Community

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**#MoreThanCode**



**#GHC19 @kathytpham**

# Niveditha Kalavakonda

Ph.D. student

BioRobotics Lab + Tech Policy Lab

University of Washington

@nkalavak

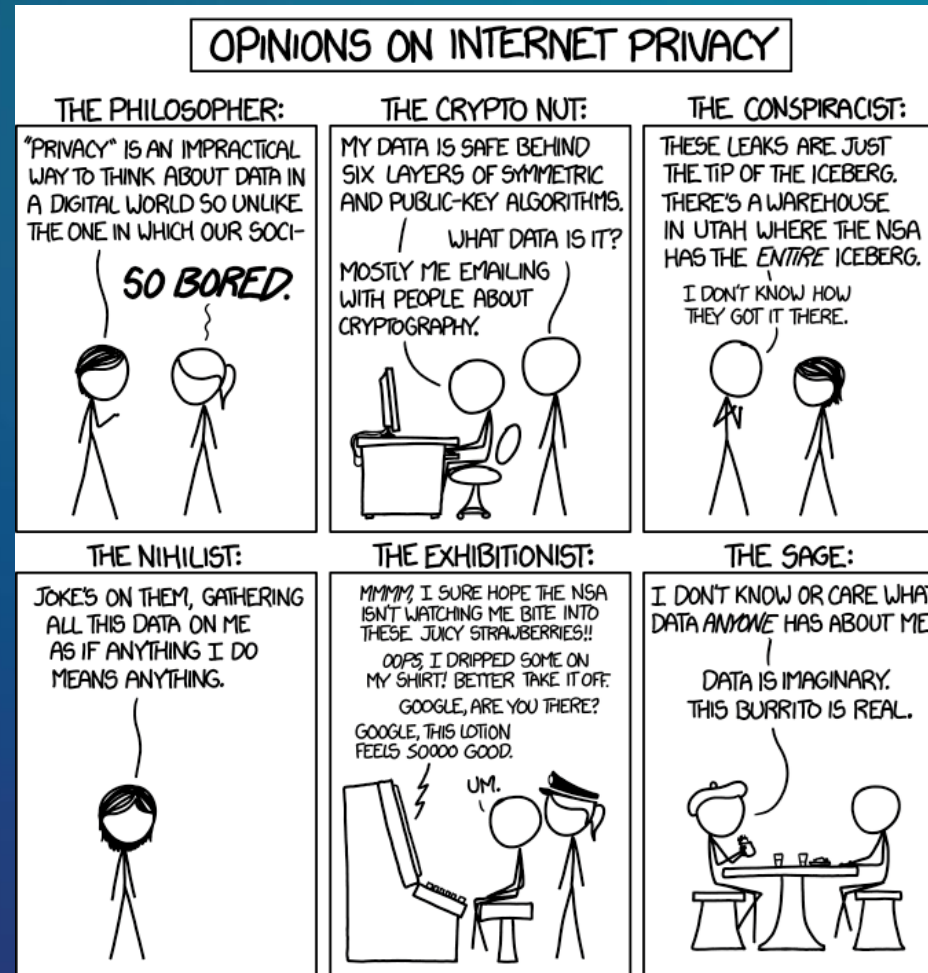




**Taking it  
global**

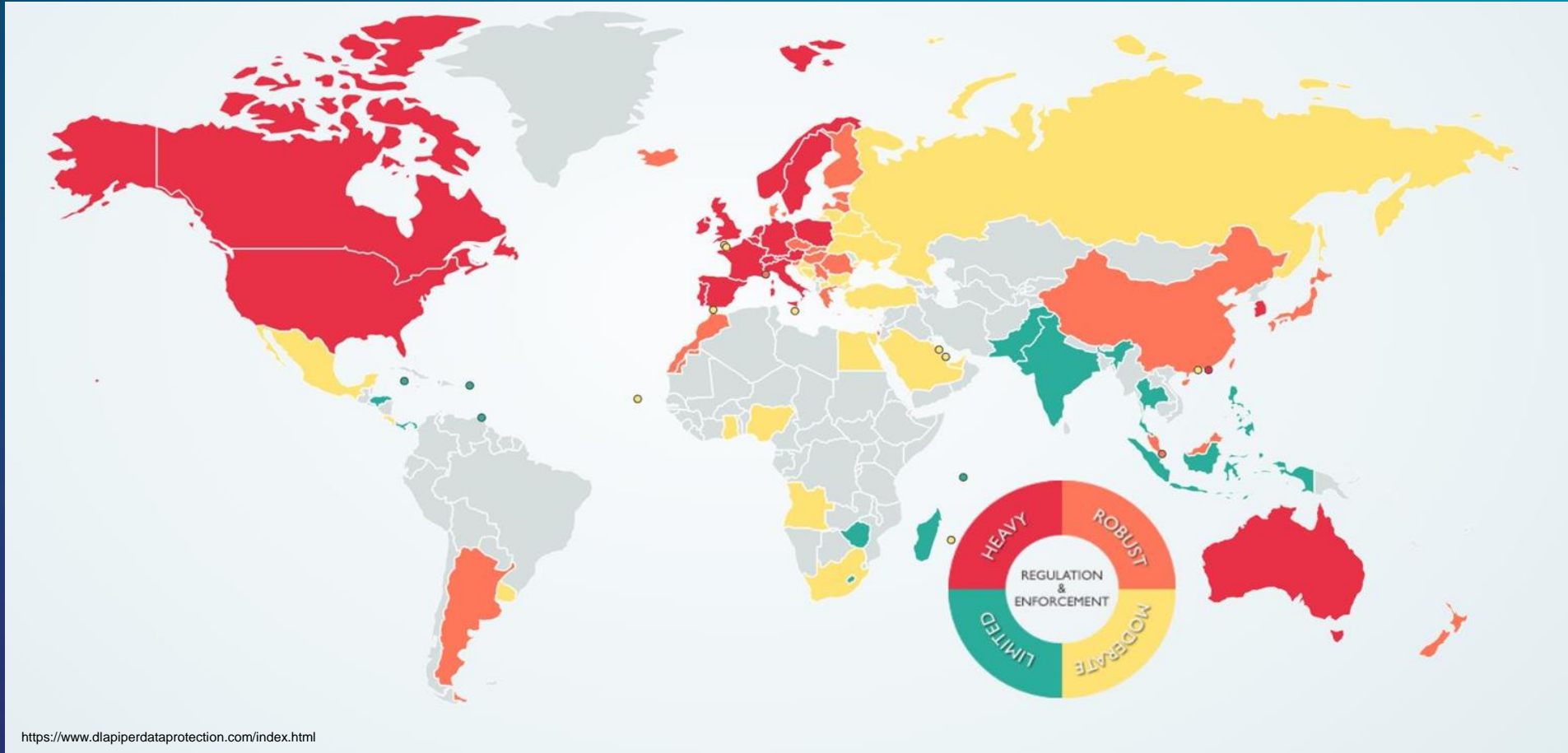


# Building for a subjective audience



# Data Protection laws across the world

*The privileged are processed by people; the poor are processed by algorithms* - Cathy O'Neil



# Panel Q&A

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**Amanda  
Casari**



**Sarah  
Hubbard**



**Hallie  
Benjamin**



**Kathy  
Phan**



**Nivii  
Kalavakonda**



## Disclaimer

*The views expressed in this panel discussion are strictly those of the individual professionals and do not represent the official policy or position of any other employer, organization, company or agency.*

