A case for research on digital identity

Sam King
But first, a little bit about me...
Started career in Illinois
Started a company, moved to CA during sabbatical
Davis High, class of ‘93 (go Blue Devils!)
Sold company to Twitter, left academia
Interested in “gig economy”, moved to Lyft
Back in academia, now in Davis
Unique industry experience for an academic

• Responsible for real products

• Found many opportunities to apply academic knowledge to products being shipped
Signup and login seem simple, but are complex

- At scale, solving login and signup issues is interesting!
Digital identity used to be username and password
Now, authentication is something app builders control and innovate on.
Before you exchange creds for auth token, check

Algorithm: suspicious login?
If it’s not suspicious, let them in

Algorithm:

suspicious login?

Collect signals

Not suspicious, login
Solution: signup and login challenges

Algorithm: suspicious login?

Collect signals

Not suspicious, login

Suspicious, challenge
If they can verify identity, log them in

Algorithm:
Collect signals
Suspicious login?

Not suspicious, login
Pass challenge, login
Suspicious, challenge

UCDAVIS
If they can’t pass, give them an out

Algorithm:

- **Suspicious login?**
  - Not suspicious, login
  - Suspicious, challenge
  - Create new account
  - Pass challenge, login
  - Collect signals

UCDAVIS
Challenges flows and algorithms complement other

Algorithm: suspicious login?

- Not suspicious, login
- Pass challenge, login
- Create new account

Suspicious, challenge

Collect signals

UC DAvis
Perfect algorithm, no need for a challenge

Algorithm:

Collect signals

Algorithm: suspicious login?

Suspicious, challenge

Not suspicious, login

Pass challenge, login

Create new account
Perfect challenge, no need for algo, just always use

Algorithm: suspicious login?

Not suspicious, login

Pass challenge, login

Create new account

Suspicious, challenge

Collect signals
Using both allows you to be imperfect

Algorithm: suspicious login?

- Not suspicious, login
- Pass challenge, login
- Create new account
-Suspicious, challenge

Collect signals
Signals, algorithms, and challenges all interesting

Algorithm:

Collect signals

Algorithm: suspicious login?

Not suspicious, login

Pass challenge, login

Create new account

Suspicious, challenge
Companies craft challenges for product / threat
Modern Identity boils down to four key questions:

1. Who is this human, in the real world

2. Is this the same human I saw in a previous session

3. Is this a bot or a human

4. Does this human own this payment method
Great, I’m in! How do I get involved?
Difficult but rewarding paths

Take sabbatical, join a company for a year (or more)
  • Don’t just write papers, ship products
  • Lots of impact, can be hard to publish papers
Ship your own app / start a company / build open source library
  • Most difficult, most flexibility in terms of publishing
Send students to companies for internships
  • Tried and true method
Discussion questions

How to do identity research in a university?

How to engage with universities as a company?

What are the most important open challenges in identity?