

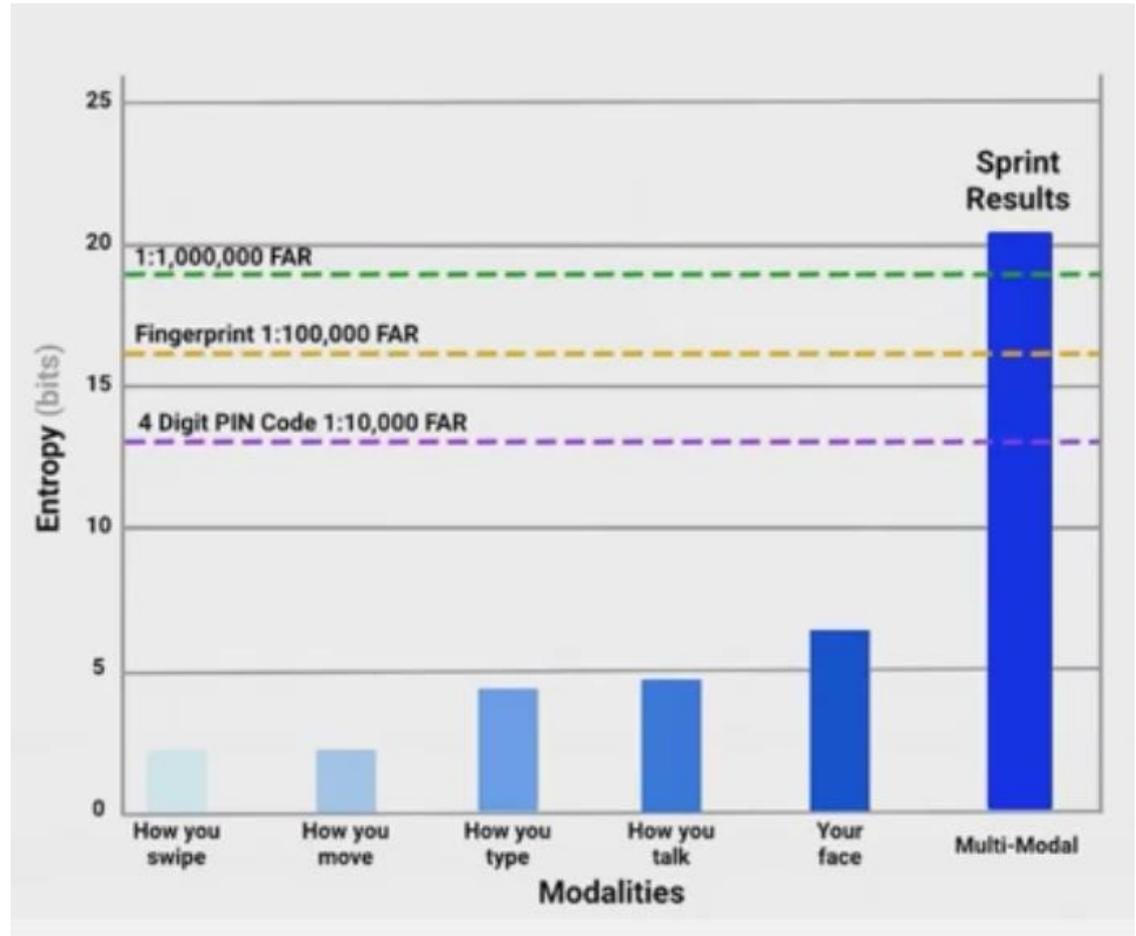
# STRENGTH OF FUNCTION FOR AUTHENTICATION COMMENTARY

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# IBIA CHARTER AND OUR INTEREST IN SOFA

- IBIA advances the adoption and responsible use of technology-based identification solutions to manage identity to enhance security, privacy, productivity, and convenience. This mission applies across the board to government, business, and consumer uses.
- We believe that authentication with a biometric as at least one factor can be more secure and convenient than traditional approaches such as ID/password.
- We support finding ways to objectively show this belief so that we can communicate it, and the general public can understand.

# ENTROPY?



# TIME?

number of Characters	Numbers only	Upper or lower case letters	upper or lower case letters mixed	numbers, upper and lower case letters	numbers, upper and lower case letters, symbols
3	Instantly	Instantly	Instantly	Instantly	Instantly
4	Instantly	Instantly	Instantly	Instantly	Instantly
5	Instantly	Instantly	Instantly	3 secs	10 secs
6	Instantly	Instantly	8 secs	3 mins	13 mins
7	Instantly	Instantly	5 mins	3 hours	17 hours
8	Instantly	13 mins	3 hours	10 days	57 days
9	4 secs	6 hours	4 days	1 year	12 years
10	40 secs	6 days	169 days	106 years	928 years
11	6 mins	169 days	16 years	6k years	71k years
12	1 hour	12 years	600 years	108k years	5m years
13	11 hours	314 years	21k years	25m years	423m years
14	4 days	8k years	778k years	1bn years	5bn years
15	46 days	212k years	28m years	97bn years	2tn years
16	1 year	512m years	1bn years	6tn years	193tn years
17	12 years	143m years	36bn years	374tn years	14qd years
18	126 years	3bn years	1tn years	23qd years	1qt years

# Faking the Touch-ID fingerprint sensor

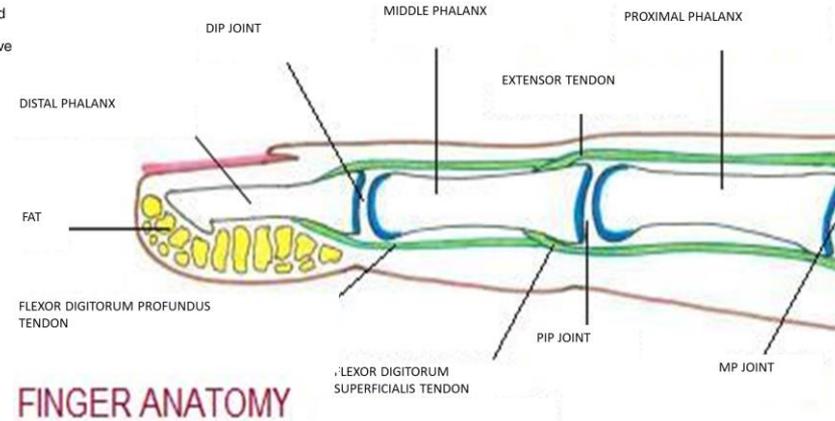
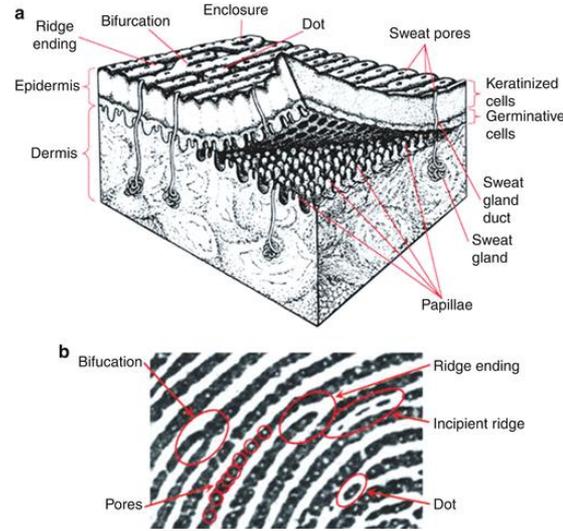
# SUGGESTIONS FOR SOFA PROPOSITION:

- In the case of targeted attacks, the measure of strength may look like:

$$\text{SOFA}_{\text{Targeted}} (\text{Biometrics}) \propto \frac{\text{Effort}}{(1 - \text{FNMR}) \times \text{PADER}}$$

- Make effort a function of time and money with dimensions of time
- Transform money to time by dividing by an hourly rate; add to time to yield effort
- At least initially, ignore the “knowledge” factor, or set it to “1”
- Add a divisor of effort which is equal to the number or worth of targets
  - Is the target an individual cell phone?
  - Or a database of all users?
- Potential difficulty: recognized process or accredited test lab for PADER

# INDUSTRY INITIATIVES TO INCREASE “EFFORT”



FINGER ANATOMY

- Sense structures beneath the epidermis, like the dermal papillae
- Sense the bone structure
- Add to more “traditional” vein structure, pulse sensing



International  
**Biometrics+Identity**  
Association

For more information please visit  
our website: [ibia.org](https://ibia.org)