computing
conference 2021

Authentication Mechanisms and Classification: A Literature Survey

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Purpose of This Research

Authentication Mechanisms

- Discover trends
- Analyze existing studies
- We aim to do as detailed classification as possible

Publishers


ACM
DL
DIGITAL
LIBRARY


ScienceDirect
ELSEVIER


IEEE Xplore®
Digital Library

Publishers – Retrieve Filter

RETRIEVE FILTER: 12 keywords / phrases

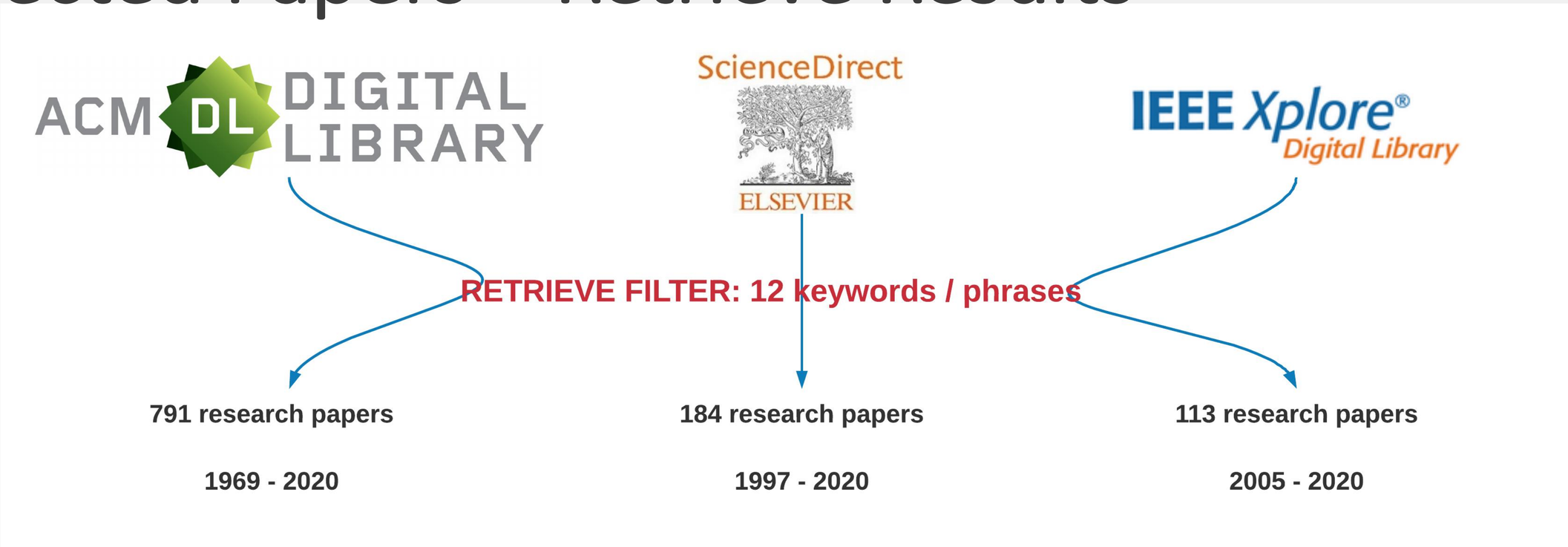
Selected Papers – Retrieve Criteria

Our search criteria among the publishers was the following:

RETRIEVE FILTER: 12 keywords / phrases

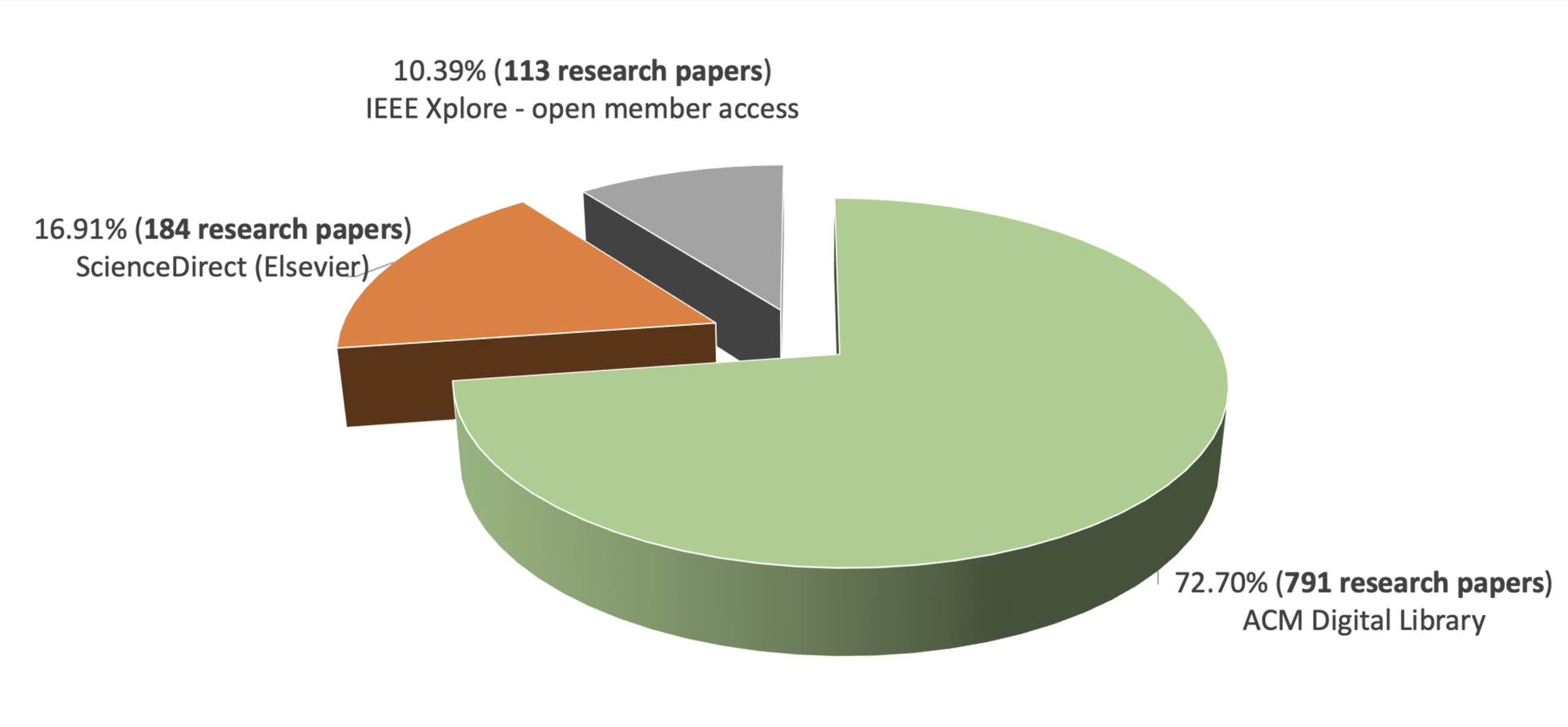
blockchain
authentication
QR-code
OTP
hash-chain
decentralized | decentralised
P2P networks
PKI
face recognition
password
augmented reality

Selected Papers – Retrieve Results

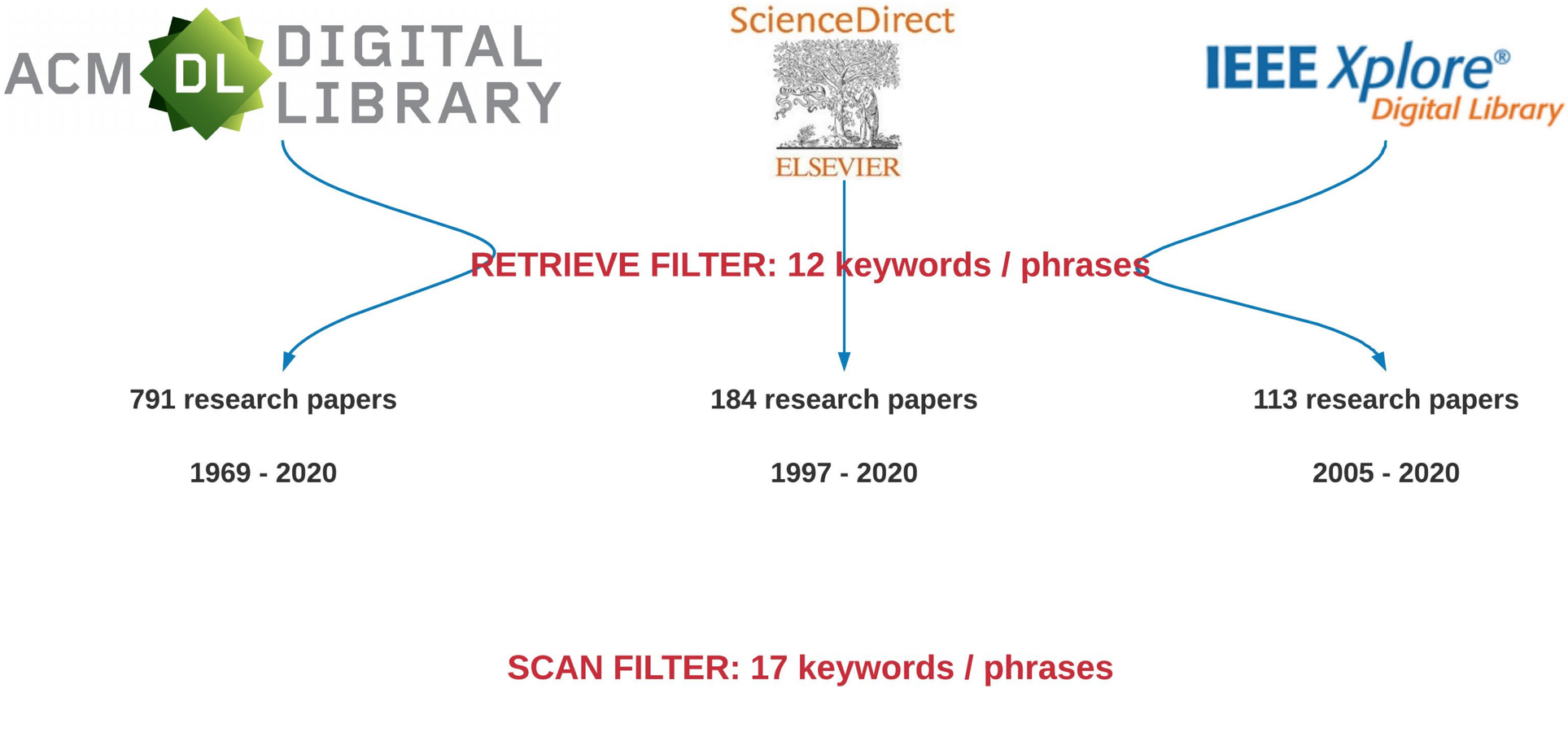


Selected Papers – Results

1088 research papers



Selected Papers – Scan Filter



Selected Papers – Scan Criteria

The search criteria within the papers was the following:

SCAN FILTER: 17 keywords / phrases

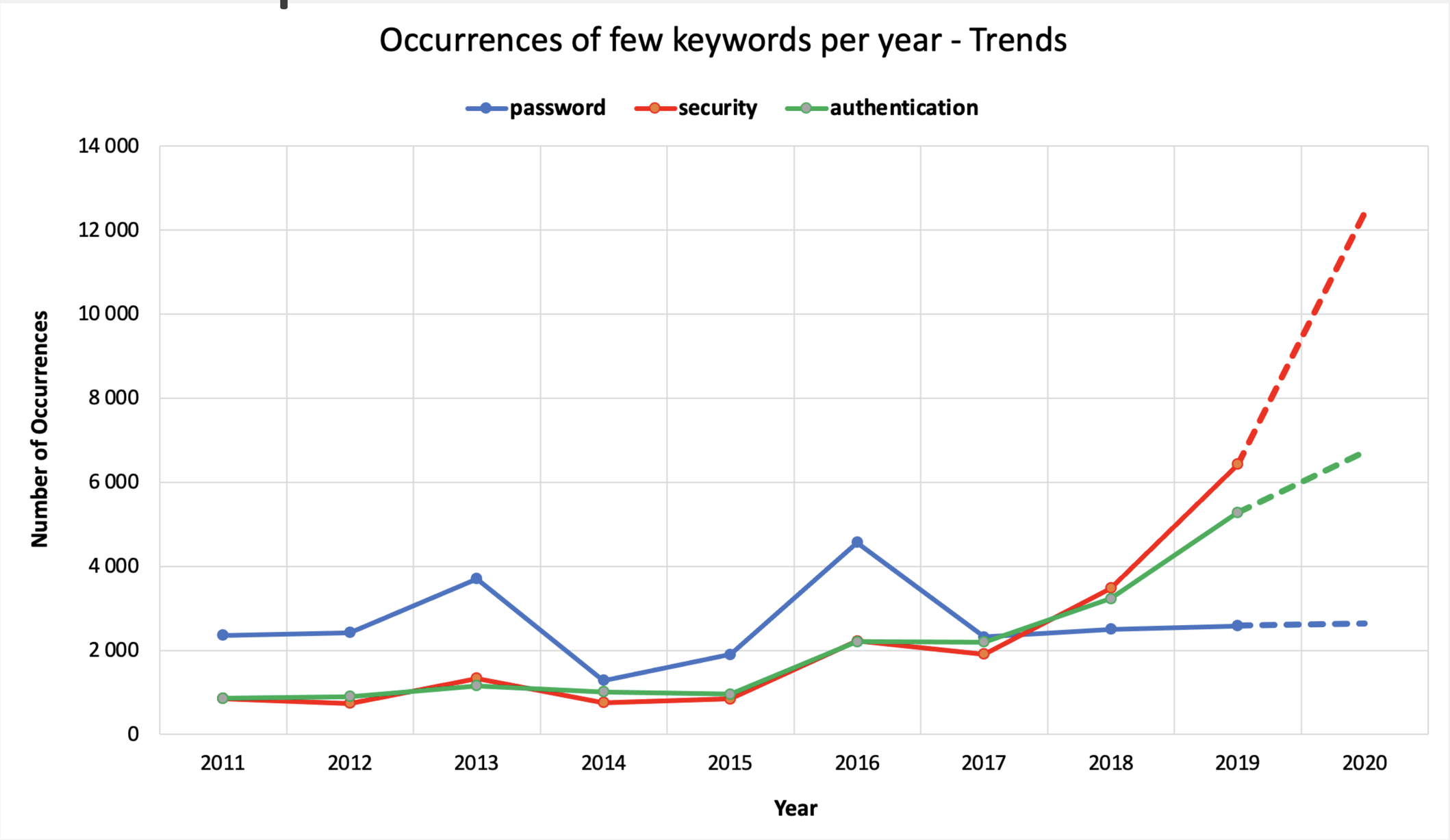
- authentication
- blockchain
- certificate
- decentralised
- decentralized
- face
- fingerprint
- MFA
- P2P
- password
- identity management
- IDM
- pattern
- network
- PIN
- PKI
- security

Selected Papers – Scan Results

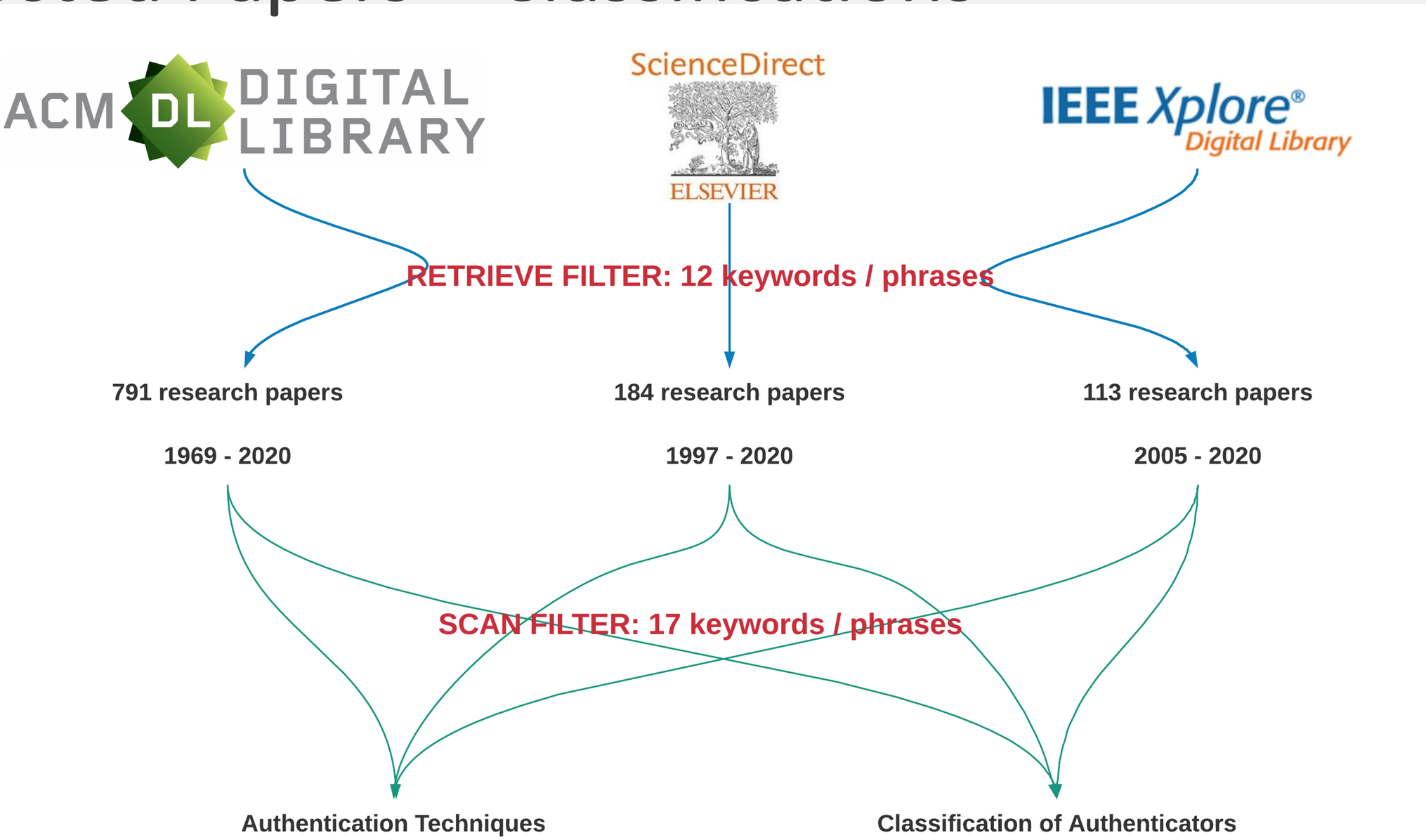
Number of occurrences in all retrieved papers: **keyword / year**

#	Keyword	Years										Grand Total
		<= 2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	mid 2020	
1	blockchain	0	0	0	0	5	23	563	2 260	8 270	20 057	9 216	**40 394**
2	password	10 246	2 355	2 424	3 707	1 285	1 903	4 569	2 316	2 500	2 587	1 322	**35 214**
3	security	4 710	851	741	1 334	755	842	2 219	1 910	3 478	6 431	6 209	**29 480**
4	authentication	4 950	859	900	1 161	1 015	955	2 203	2 199	3 230	5 281	3 365	**26 118**
5	network	1 537	486	209	1 039	523	174	669	1 298	2 644	8 405	8 064	**25 048**
6	PIN	1 435	208	208	392	119	186	356	690	1 267	1 369	1 112	**7 342**
7	face	1 592	166	550	132	965	248	237	651	660	866	938	**7 005**
8	certificate	832	421	49	22	46	599	343	566	503	729	227	**4 337**
9	decentralised | decentralized	23	2	1	4	1	1	51	184	619	1 474	825	**3 185**
10	pattern	388	82	87	244	195	165	289	300	416	368	357	**2 891**
11	fingerprint	151	57	3	10	82	244	299	84	415	487	137	**1 969**
12	PKI	387	94	3	11	24	65	175	198	186	415	303	**1 861**
13	P2P	45	33	1	161	7	0	27	46	228	333	367	**1 248**
14	MFA	2	0	0	0	0	4	105	145	26	98	517	**897**
15	IDM | identity management	61	12	2	8	69	9	141	38	71	346	133	**890**
	Grand Total	**26 359**	**5 626**	**5 178**	**8 225**	**5 091**	**5 418**	**12 246**	**12 885**	**24 513**	**49 246**	**33 092**	**187 879**

Selected Papers – Some Trends



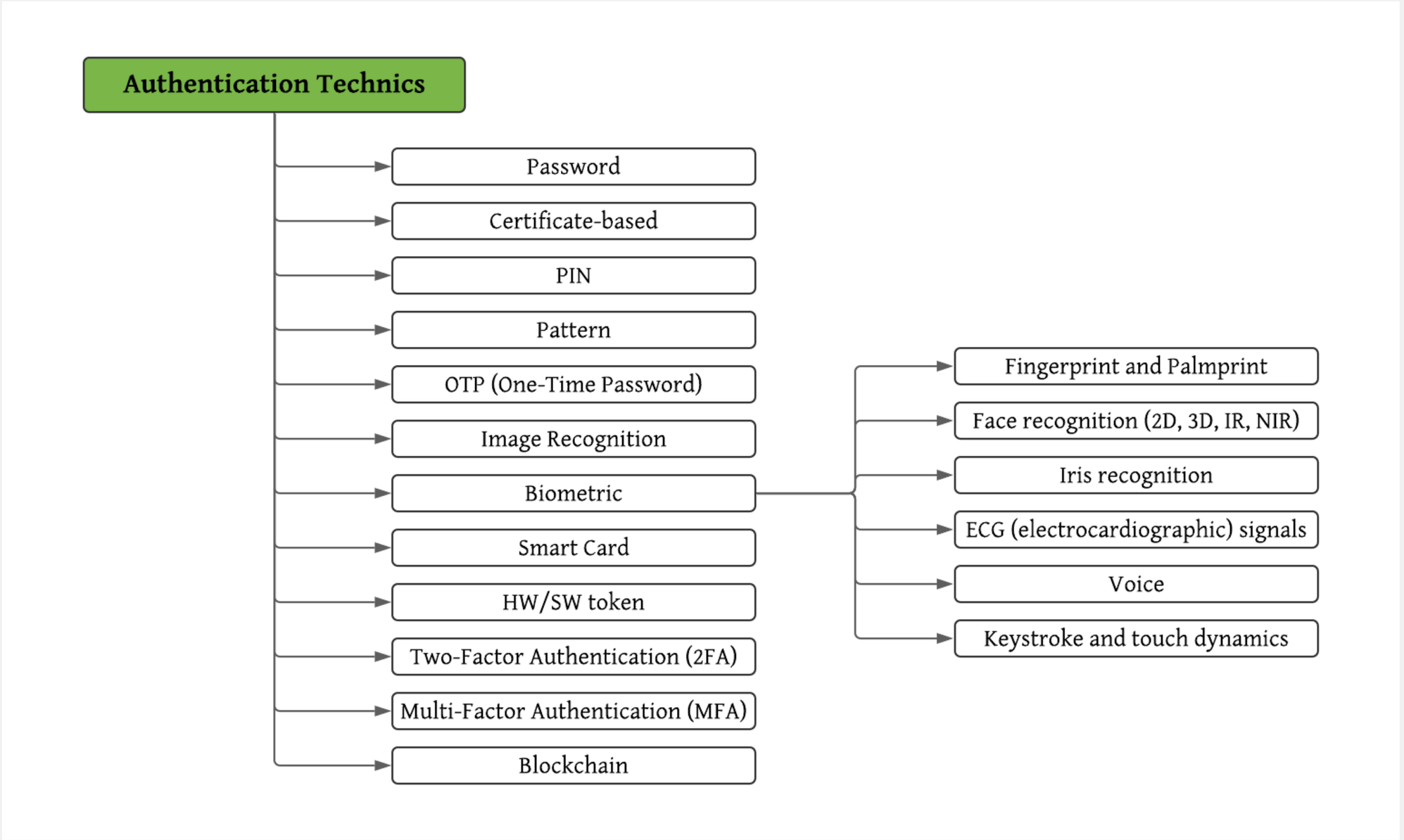
Selected Papers – Classifications



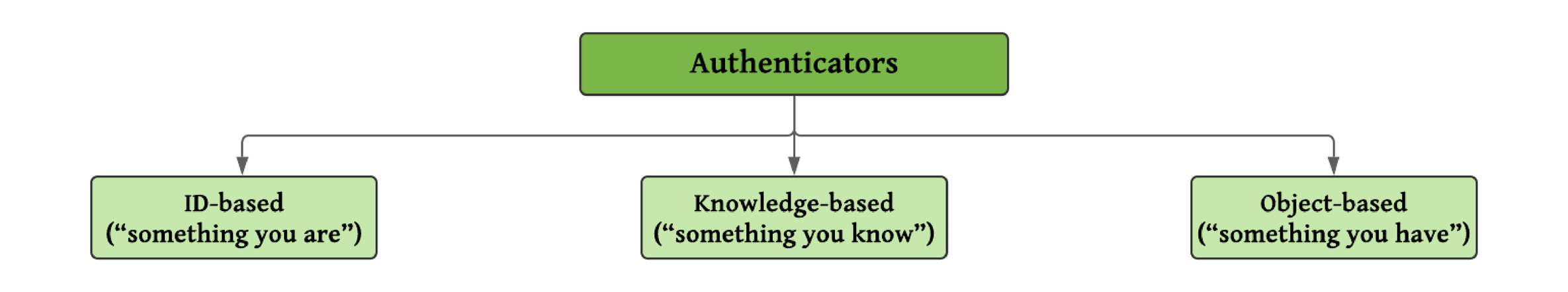
Authentication – Major Groups

- Applications for internal/external use
  - Client-Server (Thin/Thick clients)
  - Mobile device (mobile phone, tablet, smartwatch)
  - Web-based
  - Databases
- Websites
- IoT devices
- Servers
- Network devices
- Services

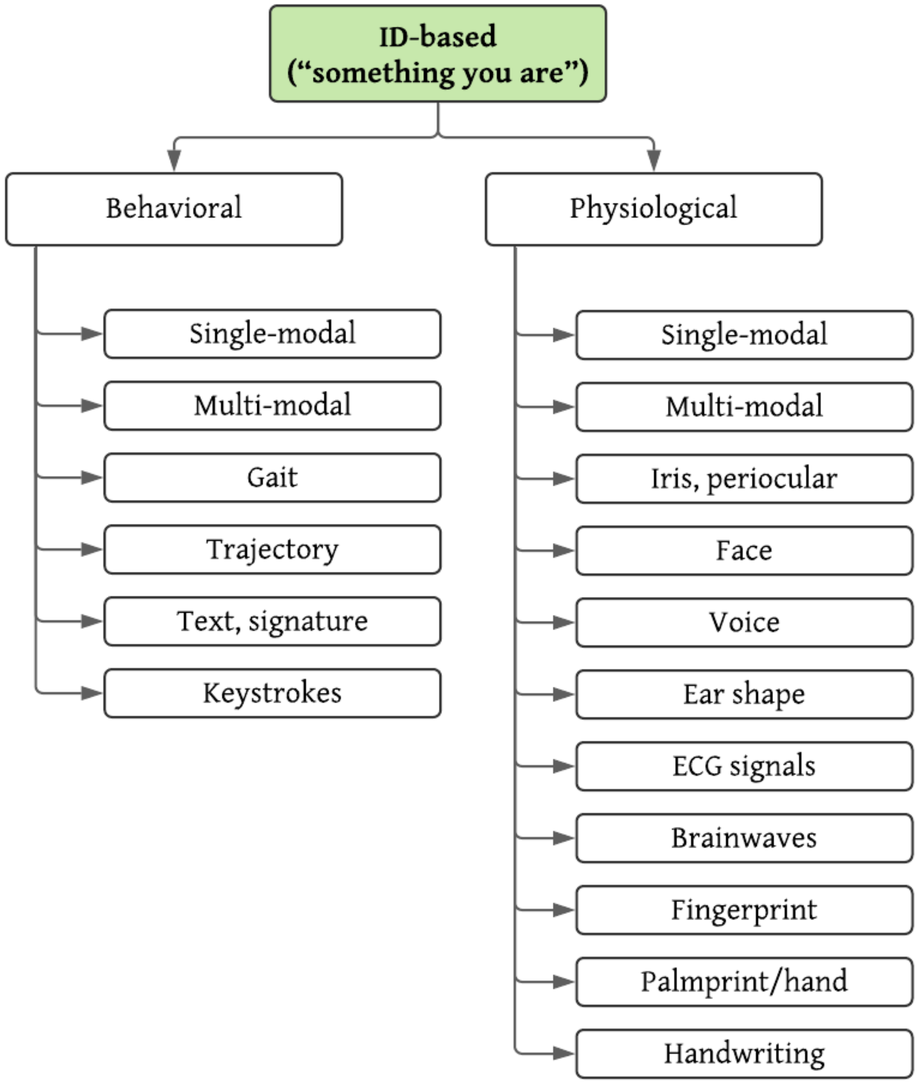
Authentication Techniques - Classification



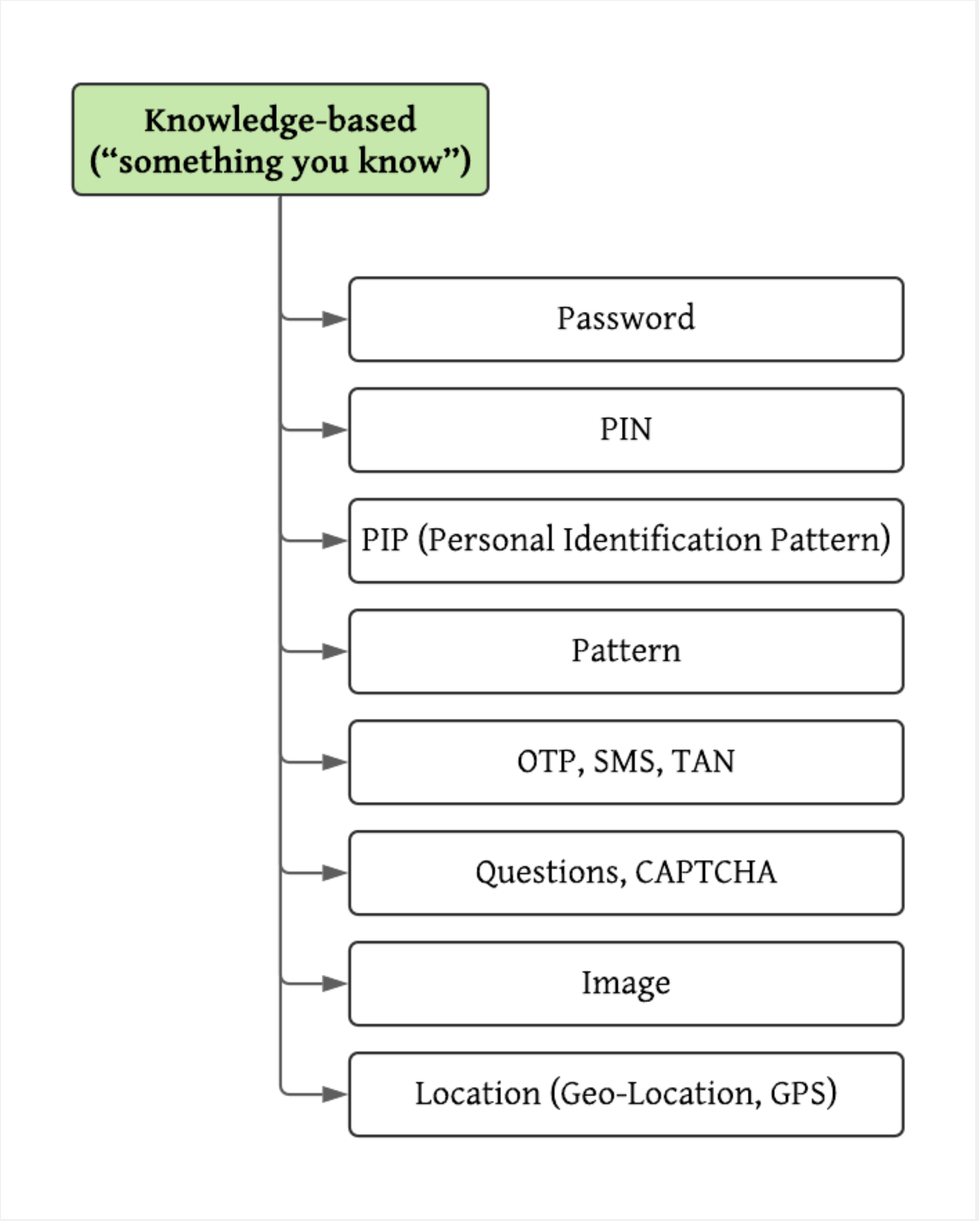
Classification of Authenticators



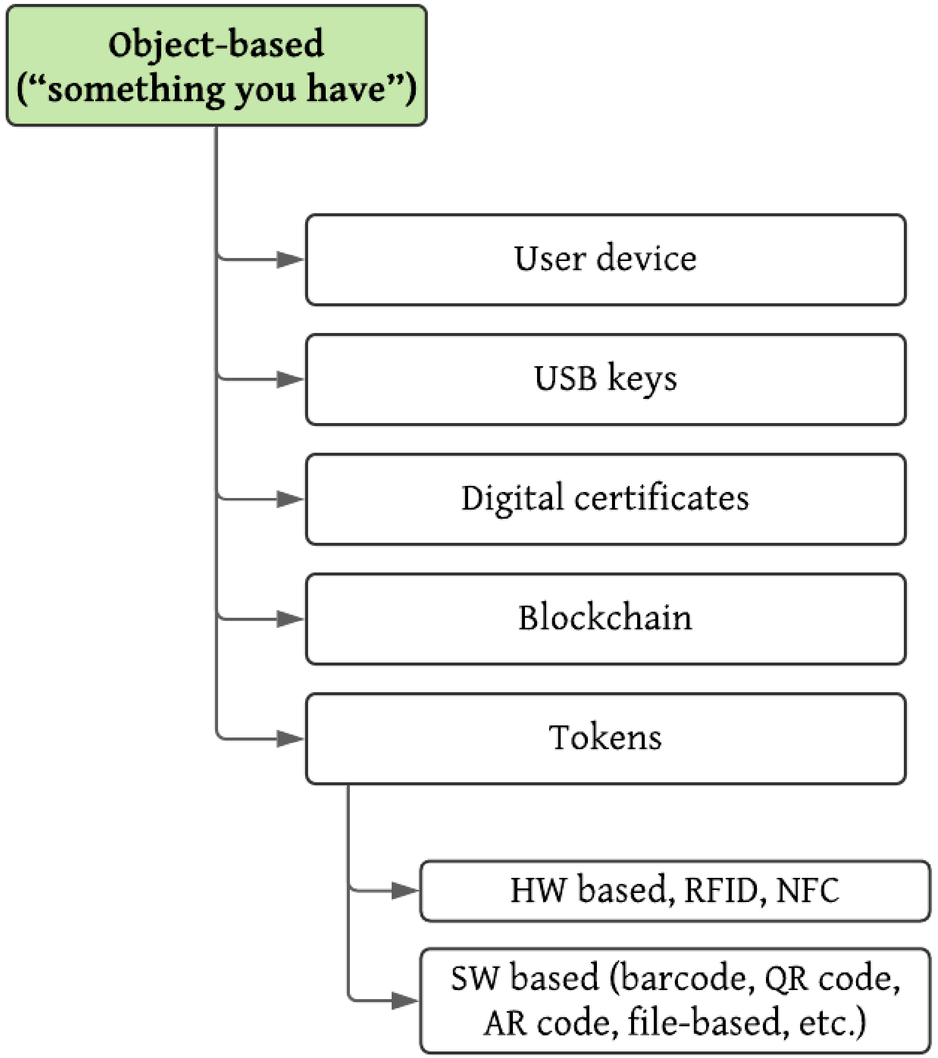
Authenticators – ID-based



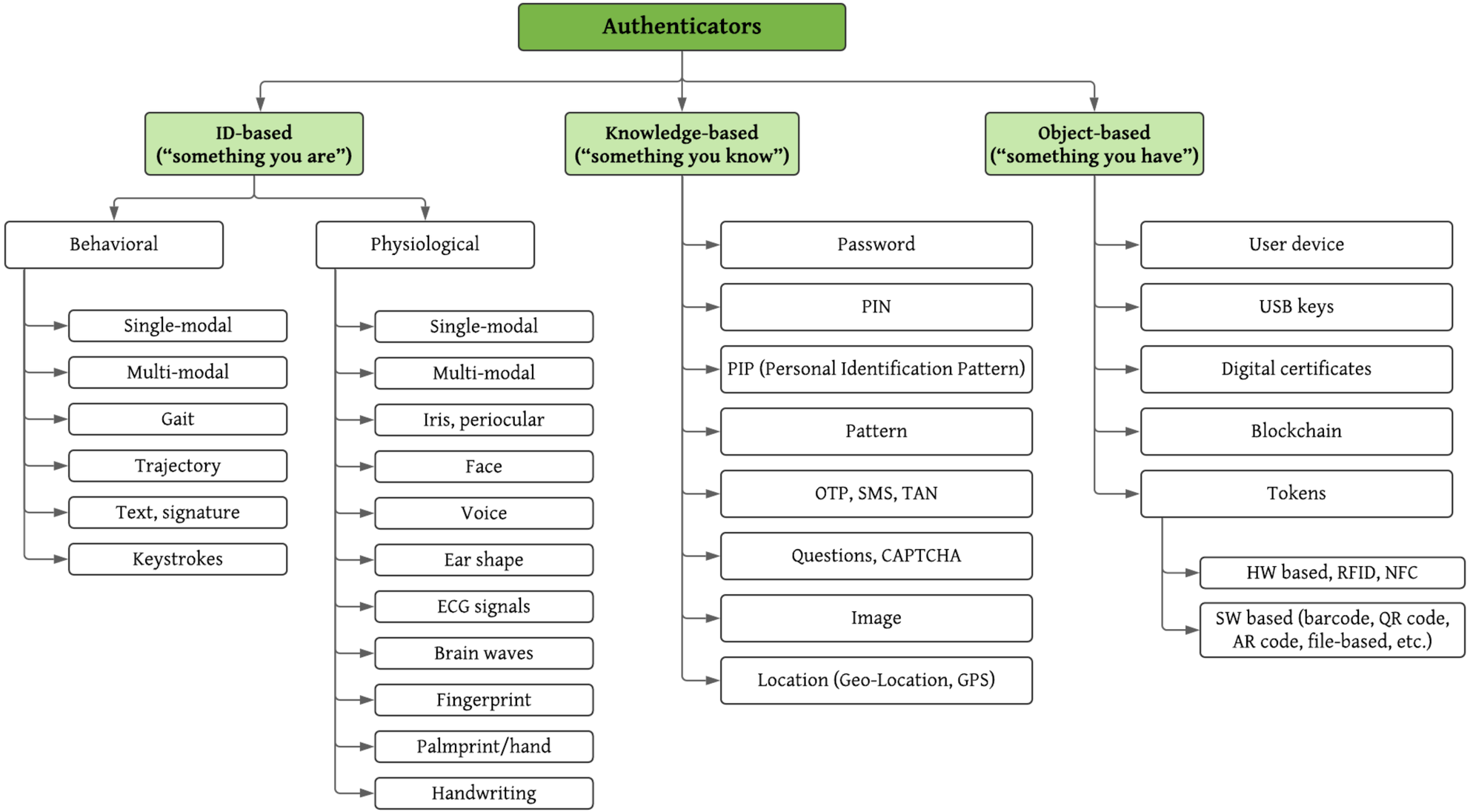
Authenticators – Knowledge-based



Authenticators – Object-based



Classification of Authenticators – All Together



Conclusion

Which is the right authentication method? - many factors are involved

Selection of authentication method depends on:

- the required/needed level of security
- the target user group(s)
- governmental and regulatory acts and standards
- company policies
- private or public access
- type of environment (dev, test, pre-prod, production)
- application complexity
- usage of cloud infrastructures
- age of the users
- different disabilities
- *… and many more*

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Thank You!

Thank you very much for your attention