

CASA

CYBER SECURITY IN THE AGE
OF LARGE-SCALE ADVERSARIES

Human Factors & Awareness in Cybersecurity

Different Use Cases & Scenarios

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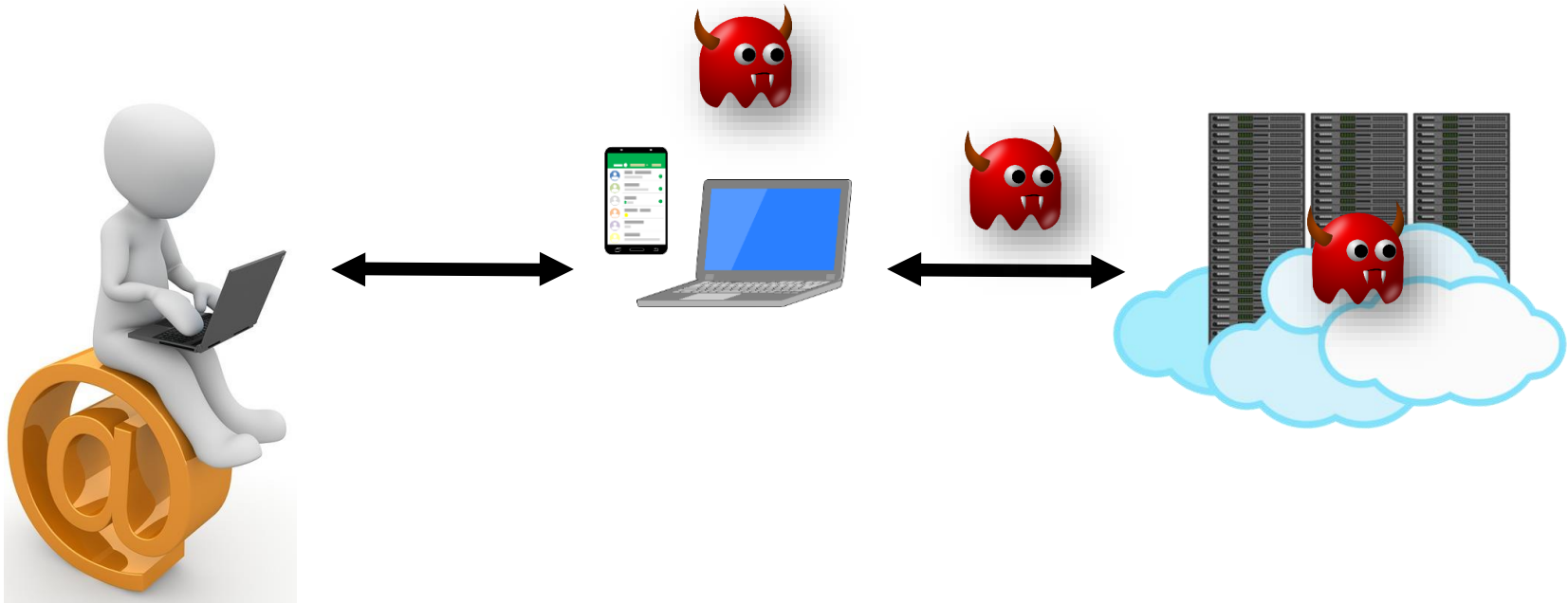
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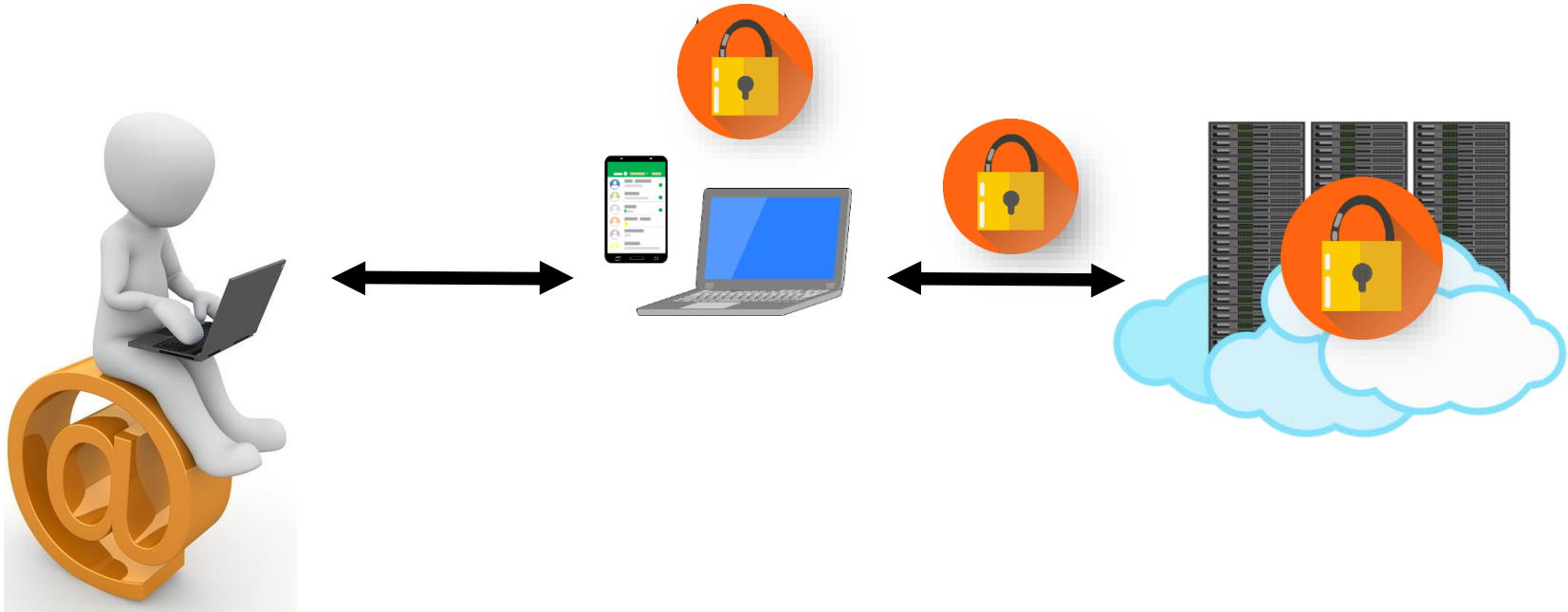
DFG Deutsche
Forschungsgemeinschaft

HGI
HORST
GÖRTZ
INSTITUT

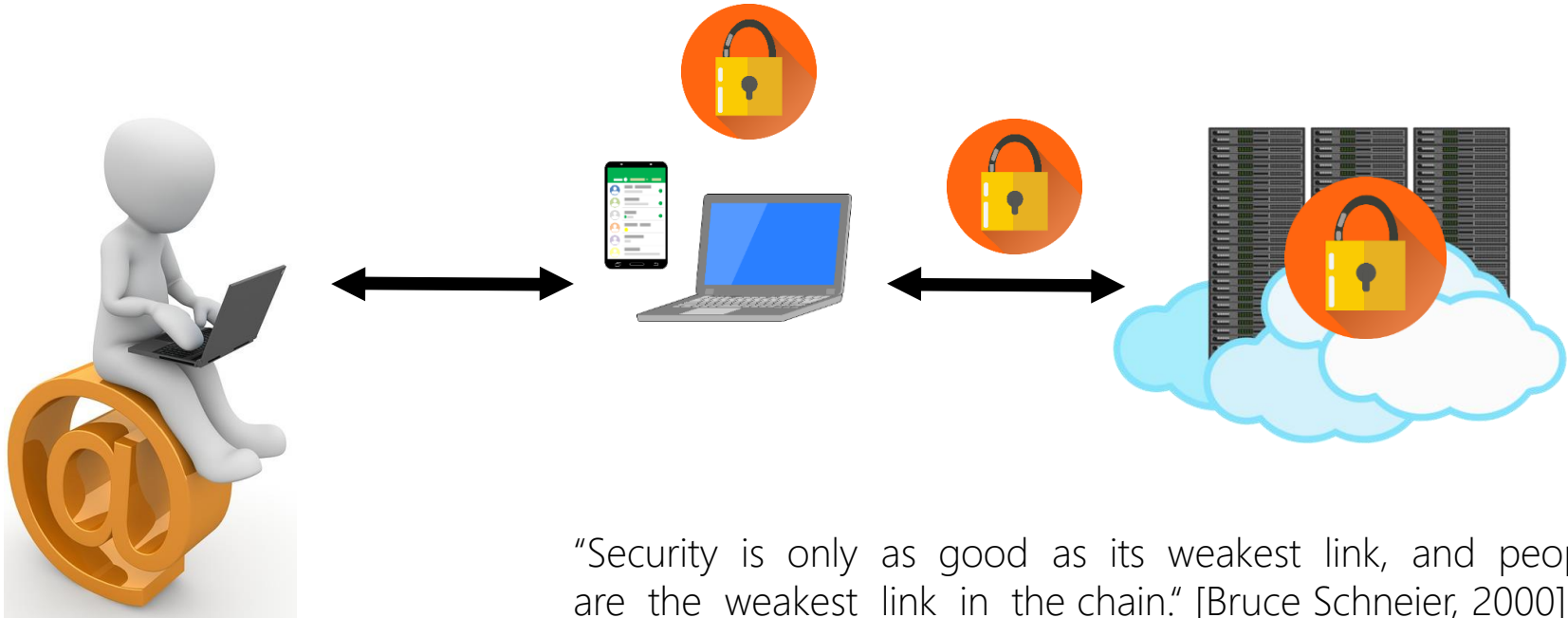
IT-SECURITY



IT-SECURITY



SECURITY CRITICAL SYSTEMS



“Security is only as good as its weakest link, and people are the weakest link in the chain.” [Bruce Schneier, 2000]

USABLE SECURITY



- Presence of an adversary
 - Tries to fool the user
 - Exploits human behavior
- The system has to be secure **and** usable

THE HUMAN THREAT



Human Adversaries

Humans are unmotivated

Humans have limitations

THE HUMAN THREAT



Security assumptions about humans are not realistic

Humans are unmotivated

Humans have limitations

CREATE DIFFERENT STRONG PASSWORDS FOR EACH ACCOUNT

Can you remember over 50 passwords that look like this:

^u2i[o41#ß



USER MENTAL MODELS



Pictures from: <https://www.behance.net/gallery/35437979/Velocipedia>

SECURITY IS MOSTLY SECONDARY



CONVENIENCE WILL ALWAYS WIN



HOW CAN WE MAKE SECURE SYSTEMS USABLE?

Invisible Security

Usable Security Mechanisms

User Training

UNDERSTANDING THE HUMAN

Awareness

Do they know about it?

What

Do they know what to do?

How

Do they know how to do it?

Motivation

Are they motivated?

Capability

Are they capable of doing it?

UNDERSTANDING THE HUMAN

Awareness

Do they know about it?

What

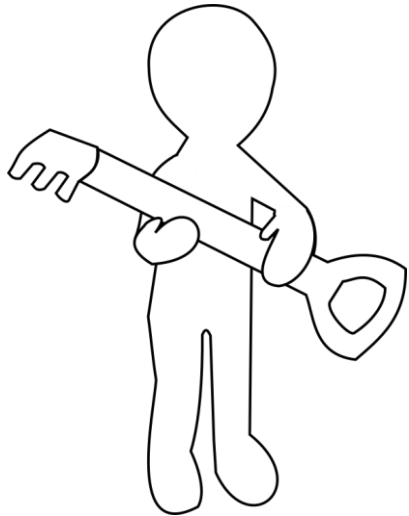
Are they really doing it?

Are they motivated?

Capability

Are they capable of doing it?

EXAMPLE: AUTHENTICATION/AUTHORIZATION

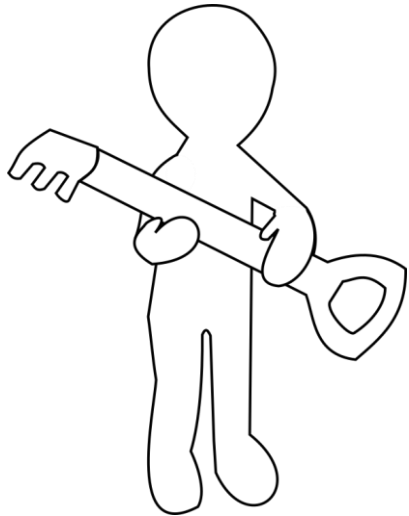


Knowledge

Ownership

Inherence

EXAMPLE: AUTHENTICATION/AUTHORIZATION

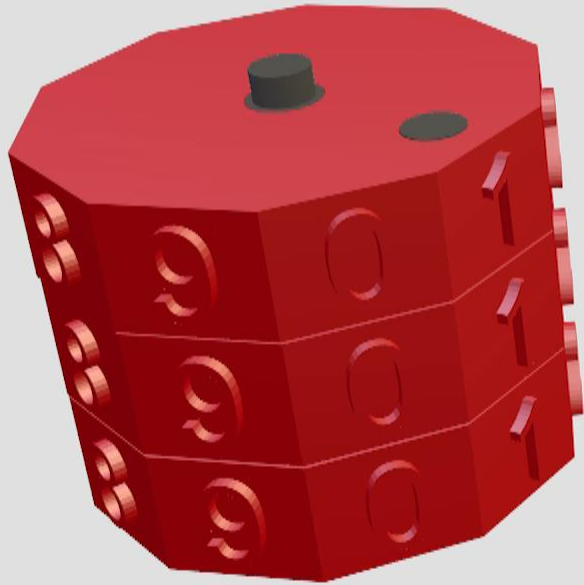


Password

One-Time Password



3D-Auth Concept



Embedded-Secret

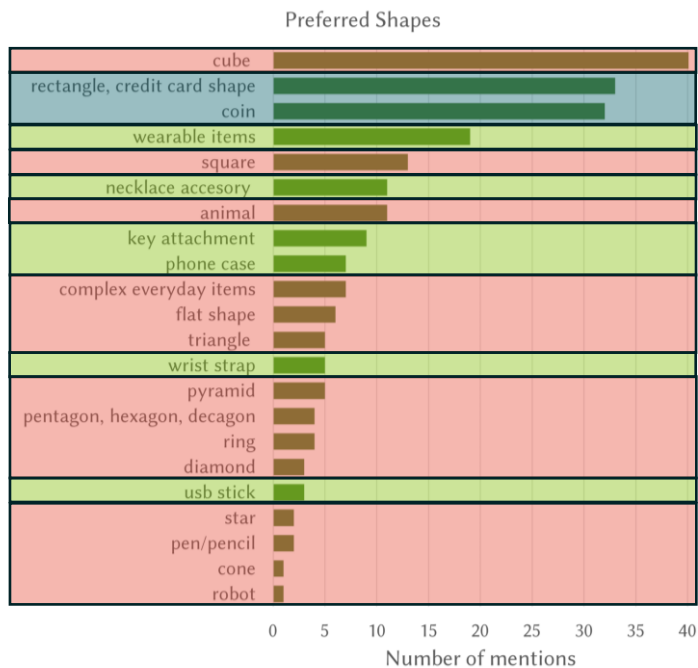


Interaction



Authentication
Pattern

Which Spape Do You Like?

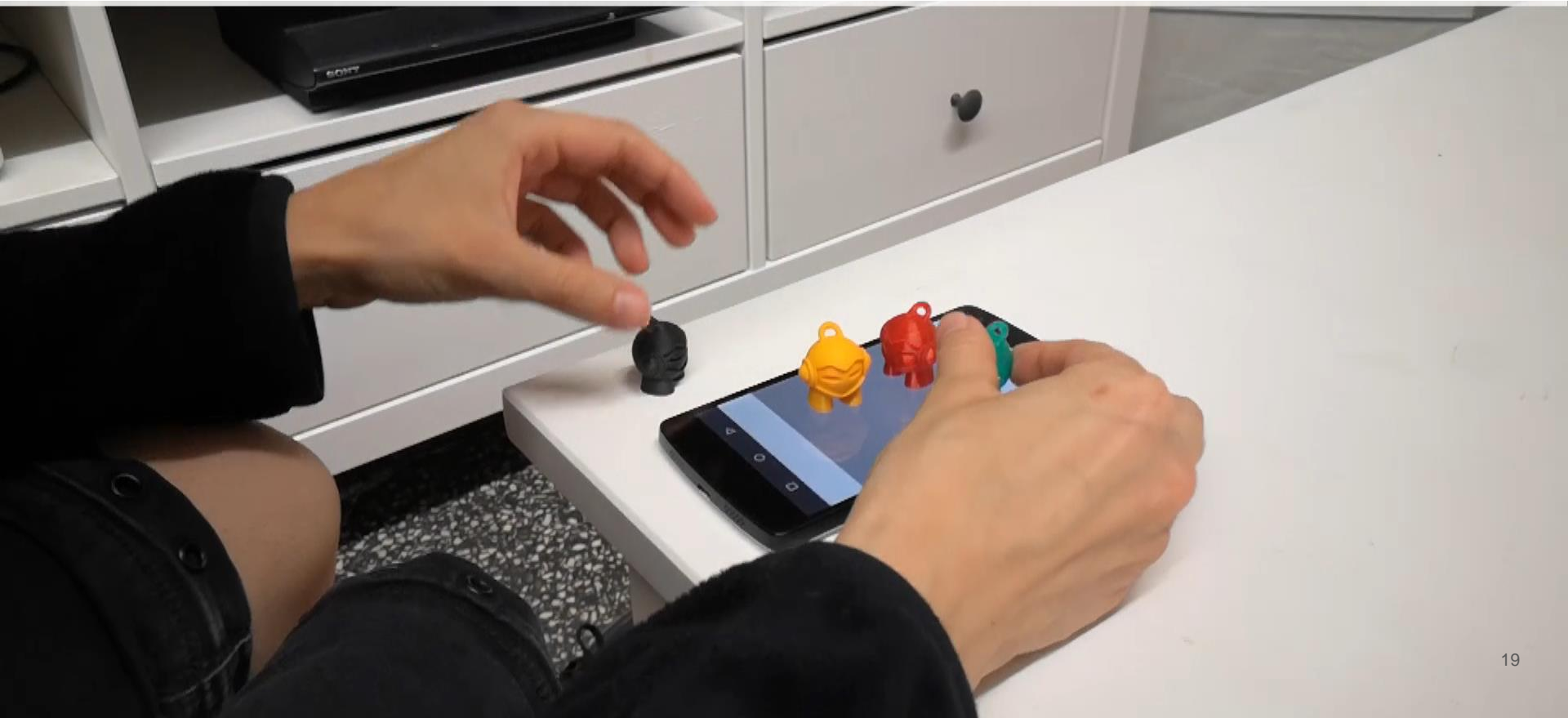


Standalone Item

Connectable

Wallet Fit

3D-Auth Vision



Thanks for your attention!

Security mechanisms are around us

They make assumptions about human behaviour that are not always realistic

We need to create human-centred mechanisms



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our newest paper



CASA: A GREAT COMMUNITY

Research at our Cluster of Excellence

- Goal: Sustainable cyber security against large-scale, especially nation-state, attackers
- 30 Mio. Euro funding through German Research Foundation (DFG): Excellent research conditions



Seven Reasons for CASA



Excellent Research Environment
With Award-Winning Scientists



Opportunities for Academic &
Professional Development



Excellent Support for Doctoral &
Postdoctoral Researchers



Budget for Courses, Conferences,
Equipment & International Exchange



Programs Designed to Support
Parents



Support Measures for Women in
IT Security



Open Team Culture

BOCHUM: IT SECURITY HOTSPOT

A Unique Security Ecosystem

- Leading research institutions:
300 researchers, 1000 students
- Numerous successful start-ups,
supported through incubator
- Home of various established
companies (G-Data, escrypt)



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