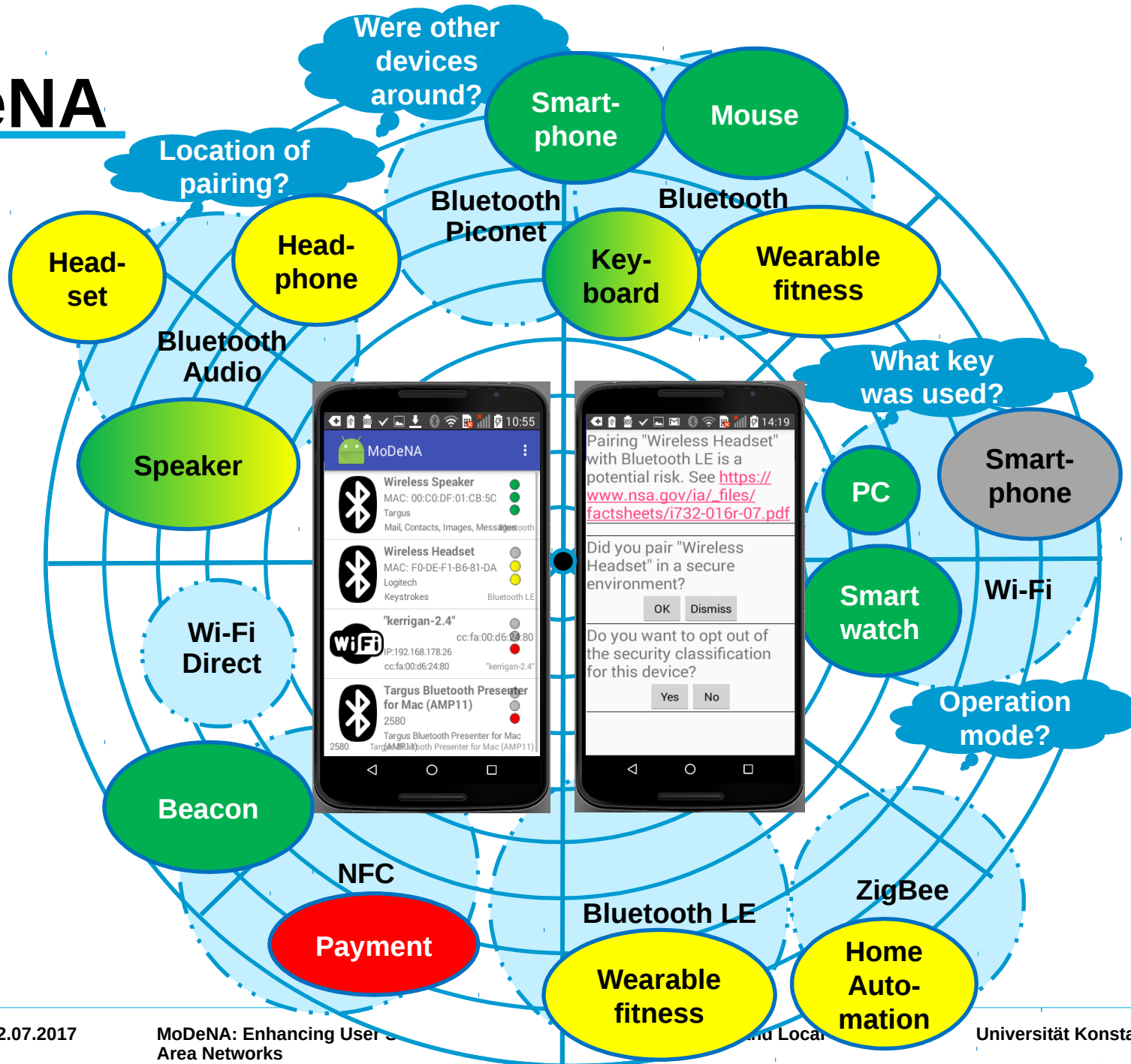


# **MoDeNA: Enhancing User Security for Devices in Wireless Personal and Local Area Networks**

**Robert Müller, Marcel Waldvogel, and  
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# MoDeNA



# Problem Statement/ Motivation

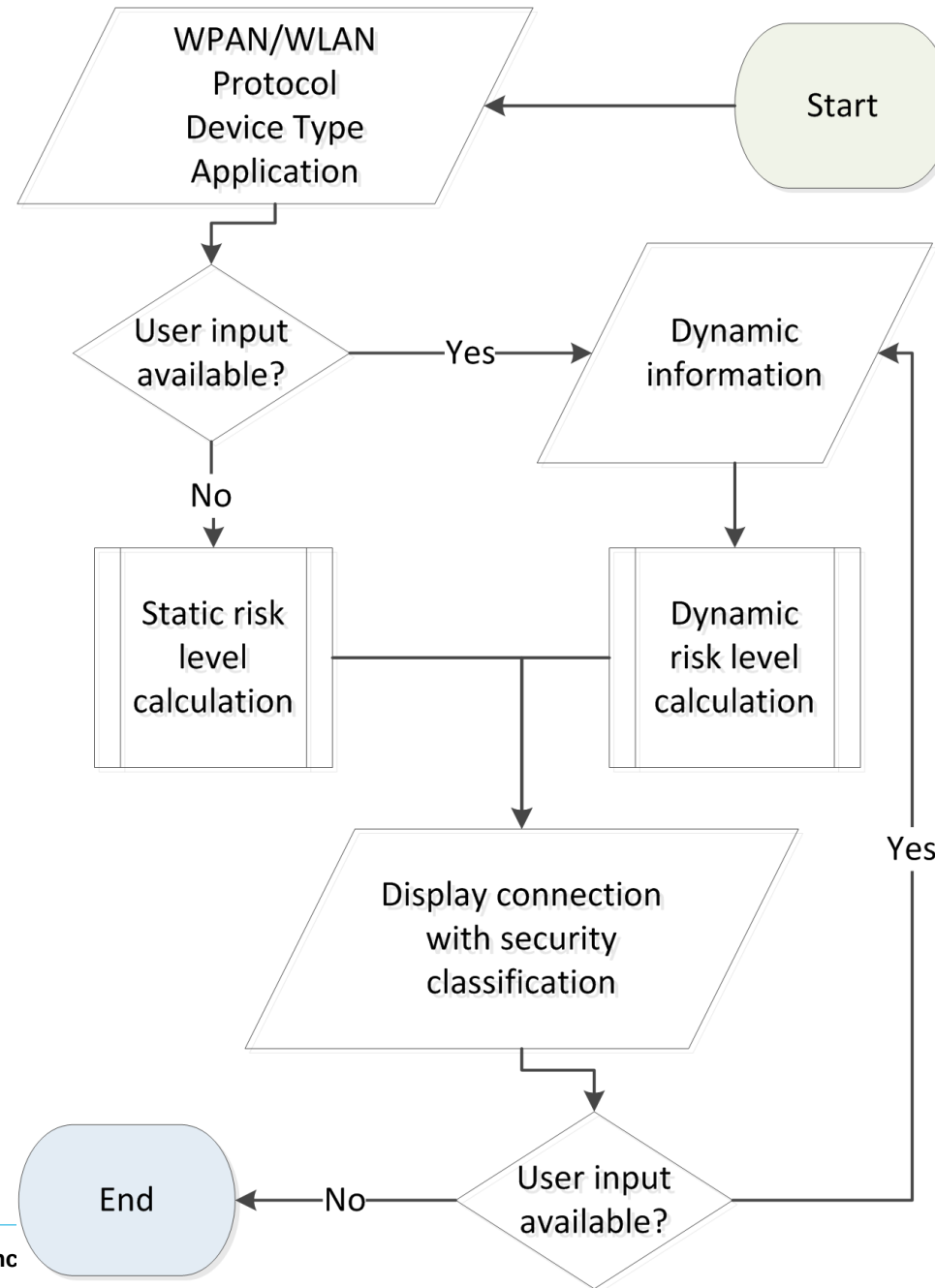
Device	Protocol	Security
Smart Watch	Wi-Fi , Bluetooth	High
Wearable Fitness	Wi-Fi, Bluetooth	Low/Acceptable/High
Wireless Speaker	Wi-Fi, Bluetooth	Low
Wireless Headphone	Wi-Fi, Bluetooth	Acceptable
Wireless Headset	Wi-Fi, Bluetooth	Acceptable
Hearing Aid	Bluetooth	Low
Wireless Keyboard	Wi-Fi, Bluetooth	High
Wireless Mouse	Wi-Fi, Bluetooth	Acceptable
Wireless Door key	Wi-Fi, Bluetooth, Bluetooth LE	High
Wireless Presentator	Wi-Fi, Bluetooth, Bluetooth LE	Acceptable





**Table 1.** IoT devices and typical network protocols

- Data sharing
- # devices
- Security awareness

# Classification

## Static and dynamic input



- 
**Wireless Speaker**
  - MAC: 00:C0:DF:01:CB:5C
  - Targus
  - Mail, Contacts, Images, Messages
- 
**Wireless Headset**
  - MAC: F0-DE-F1-B6-81-DA
  - Logitech
  - Keystrokes
  - Bluetooth LE
- 
**"kerrigan-2.4"**
  - IP: 192.168.178.26
  - cc:fa:00:d6:24:80
  - "kerrigan-2.4"
- 
**Targus Bluetooth Presenter for Mac (AMP11)**
  - 2580
  - Targus Bluetooth Presenter for Mac (AMP11)

Pairing "Wireless Headset" (MAC: F0-DE-F1-B6-81-DA) via Bluetooth LE in an crowded public place can be dangerous. Personal Data "Mail, Contacts, Images, Messages" may be eavesdropped passively or actively. There are known attacks. For further information see [https://www.nsa.gov/ia/\\_files/factsheets/i732-016r-07.pdf](https://www.nsa.gov/ia/_files/factsheets/i732-016r-07.pdf)

It is recommended to pair the device "Wireless Headset" via Bluetooth LE with this smartphone in a secure environment like at home or at an isolated place.

Did you pair the device "Wireless Headset" in a secure environment?

OK Dismiss

# Evaluation

## Two-part user study with 23 participants

- **Wireless Network Smartphone Security**
  - 87% data on smartphones is private data
  - 70% know about security concerns of smartphone data but accept the possible risks
  - 87% more protection of their personal data on their smartphone
  - 83% apply security measures recommended by their smartphone
- **Application Specific Wireless Security**
  - 91% like or mostly like MoDeNA usability
  - 87% expect MoDeNA would improve the WPAN/WLAN security of their smartphones
  - 78% like the simplified security classification output scheme
  - 74% gained insight in security of WPAN/WLAN

**Thank  
You!**

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