



# ATM Fraud Detection

Seminar Wissensbasierte Systeme

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# Agenda

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- An introduction into ATMs
  - Functions
  - Authentication
  
- ATM Fraud
  - Skimming / Identity Theft
  
- ATM Fraud Prevention
  - EMV Standard
  
- ATM Fraud Detection
  - General techniques
  - Mask detection
  - Data visualization & pattern recognition



# An introduction into ATMs

- A: Screen
- B: Card Slot
- C: Button Pad
- D: Select Buttons
- E: Cash Slot
- F: Receipts Slot



[Workmobility]



- What can we do at an ATM?
  - Withdraw cash
  - Transfer money
  - Check balance
  - Recharge cellphones
  - Deposit cash



# An introduction into ATMs

## Authentication through Card and PIN



[*about.com*]



[*sc.com*]



## Skimming



[Techteachtoo.com]



## Magnetic stripe card



VS

## Smart card

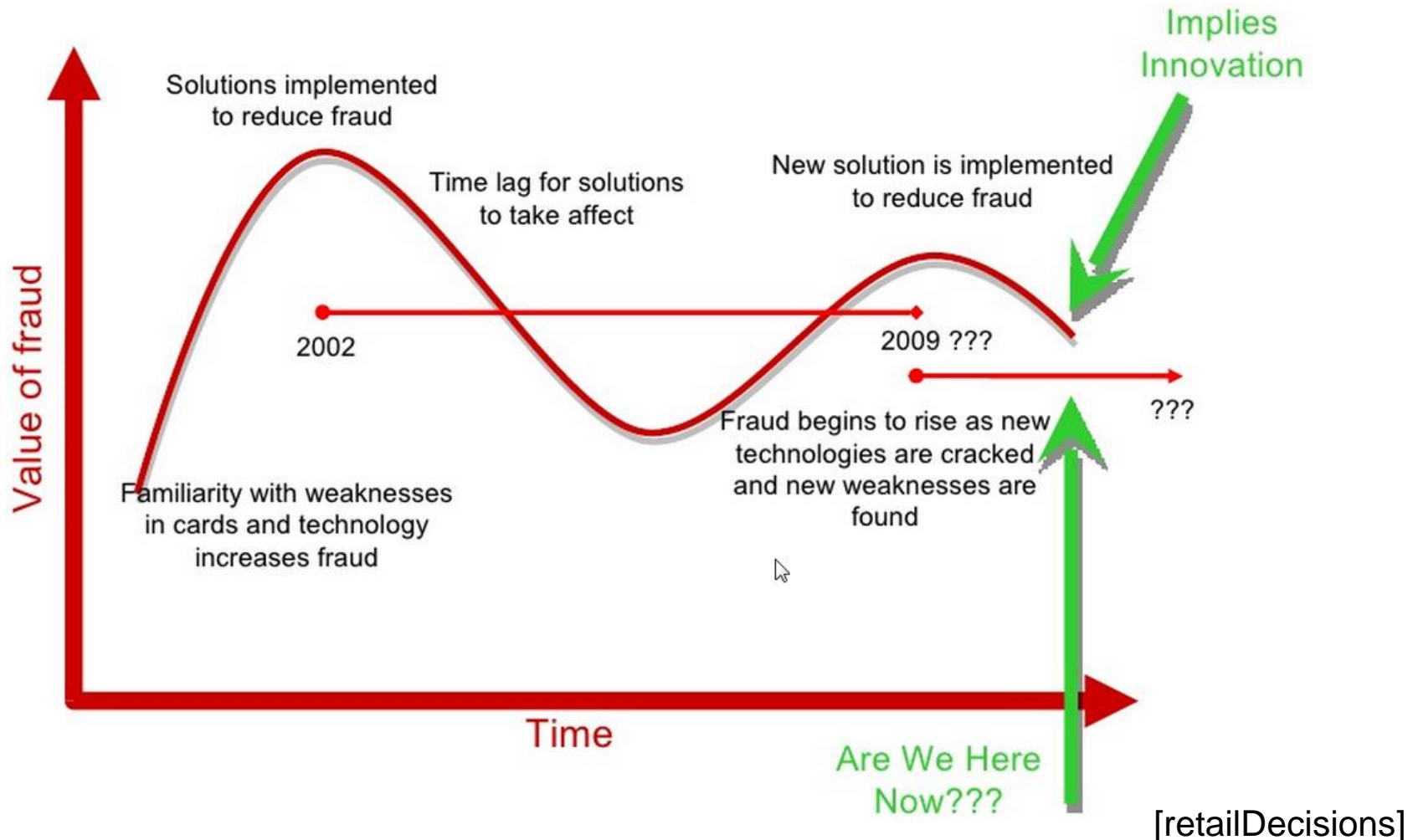


[wikipedia]





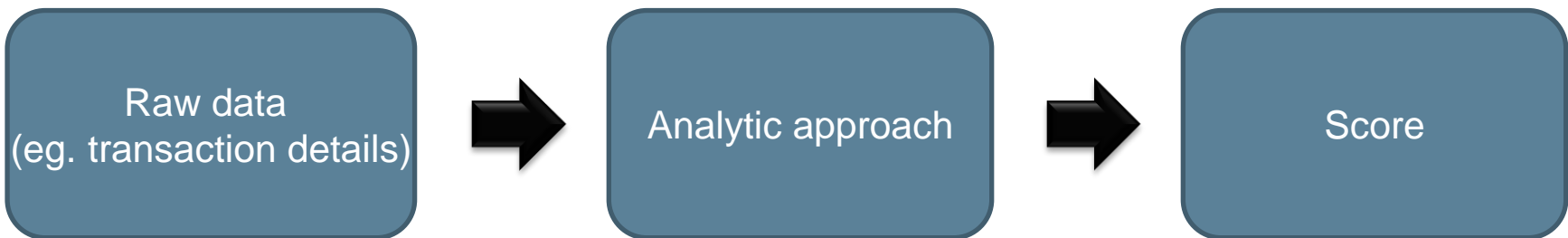
## Fraud Life Cycle – an arms race



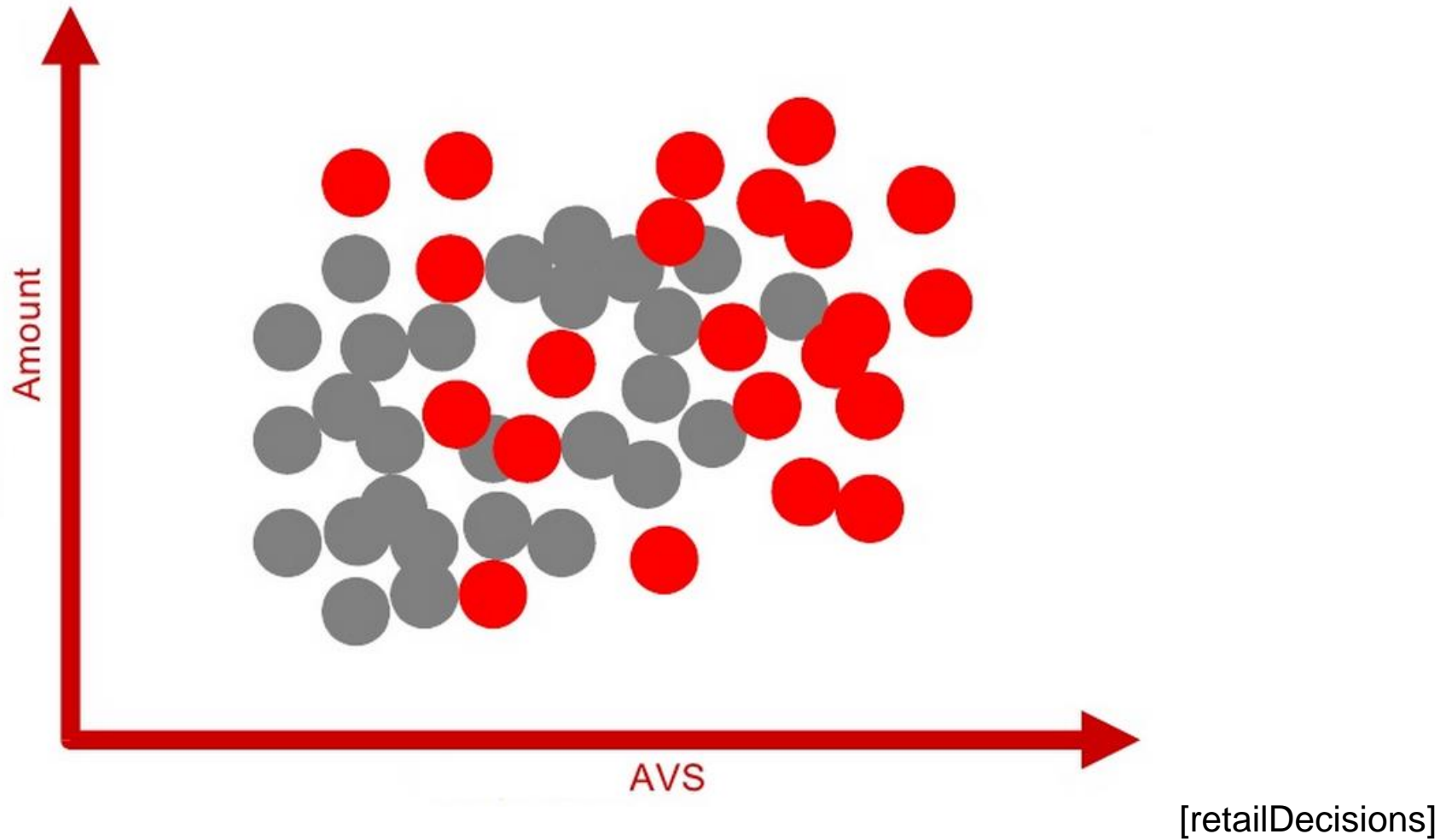


# ATM Fraud Detection

## General approach



- Decision making is not easy



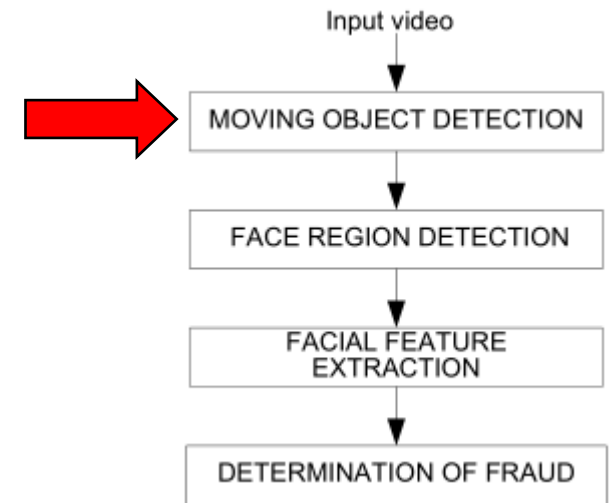
# ATM Fraud Detection - Image-based Fraud Detection



[yonsei.ac.kr]



# ATM Fraud Detection - Image-based Fraud Detektion [Dong]



(a)



(b)



(c)



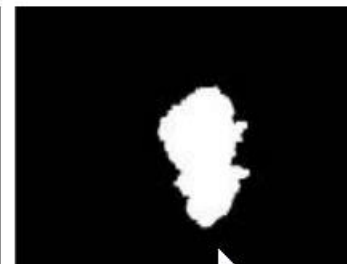
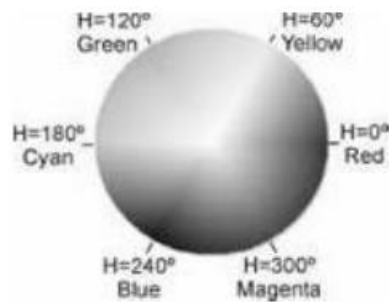
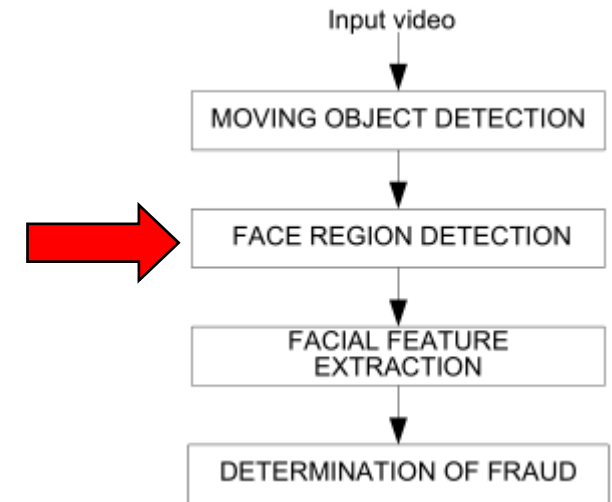
(d)



(e)



# ATM Fraud Detection - Image-based Fraud Detection



(a)

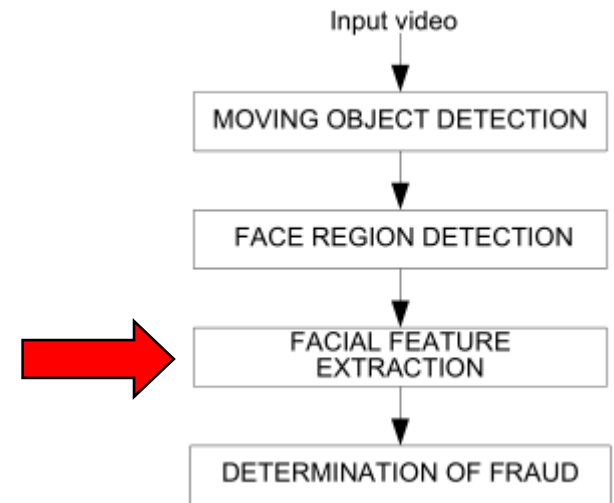
(b)

(c)

(d)



# ATM Fraud Detection - Image-based Fraud Detection



(a)



(b)



(c)



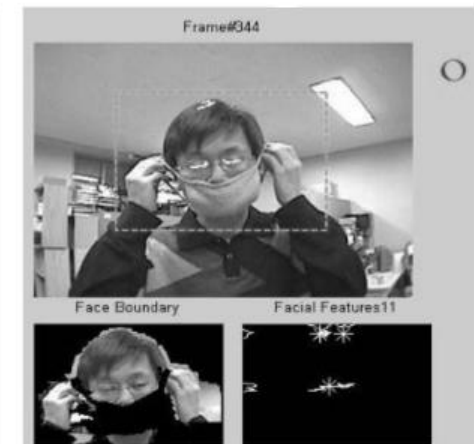
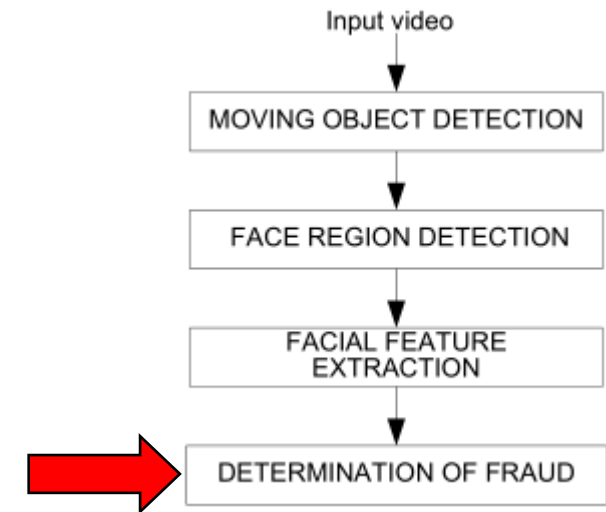
(d)



(e)



# ATM Fraud Detection - Image-based Fraud Detection





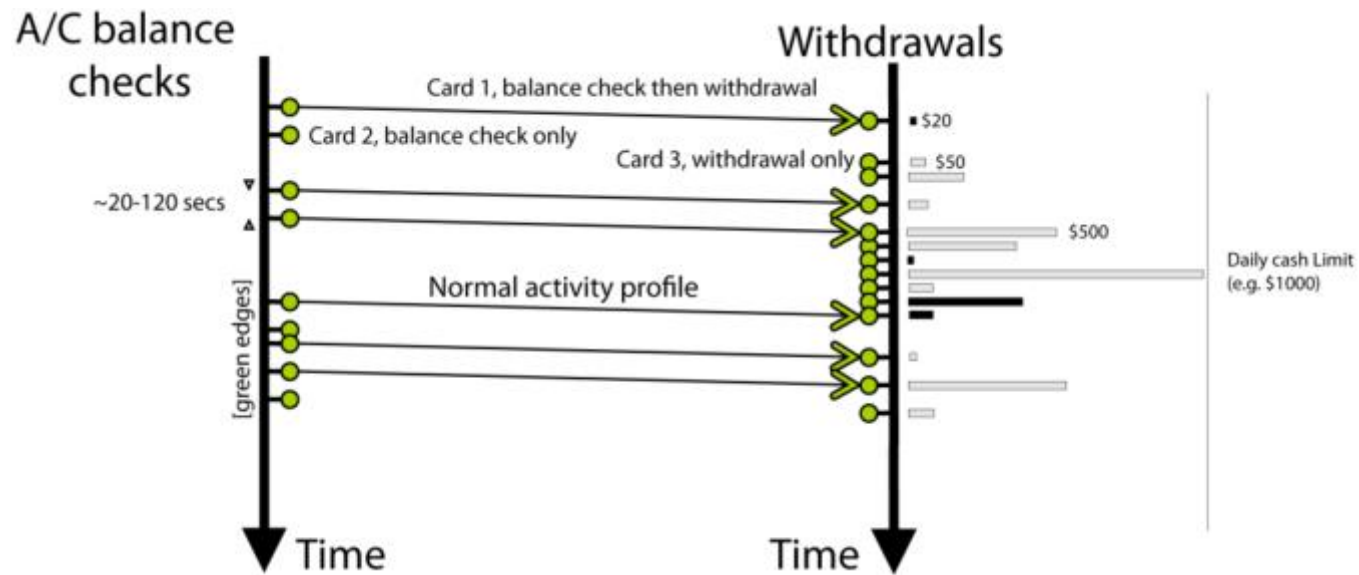
# ATM Fraud Detection - Visualization of ATM Usage Patterns [Reardon]



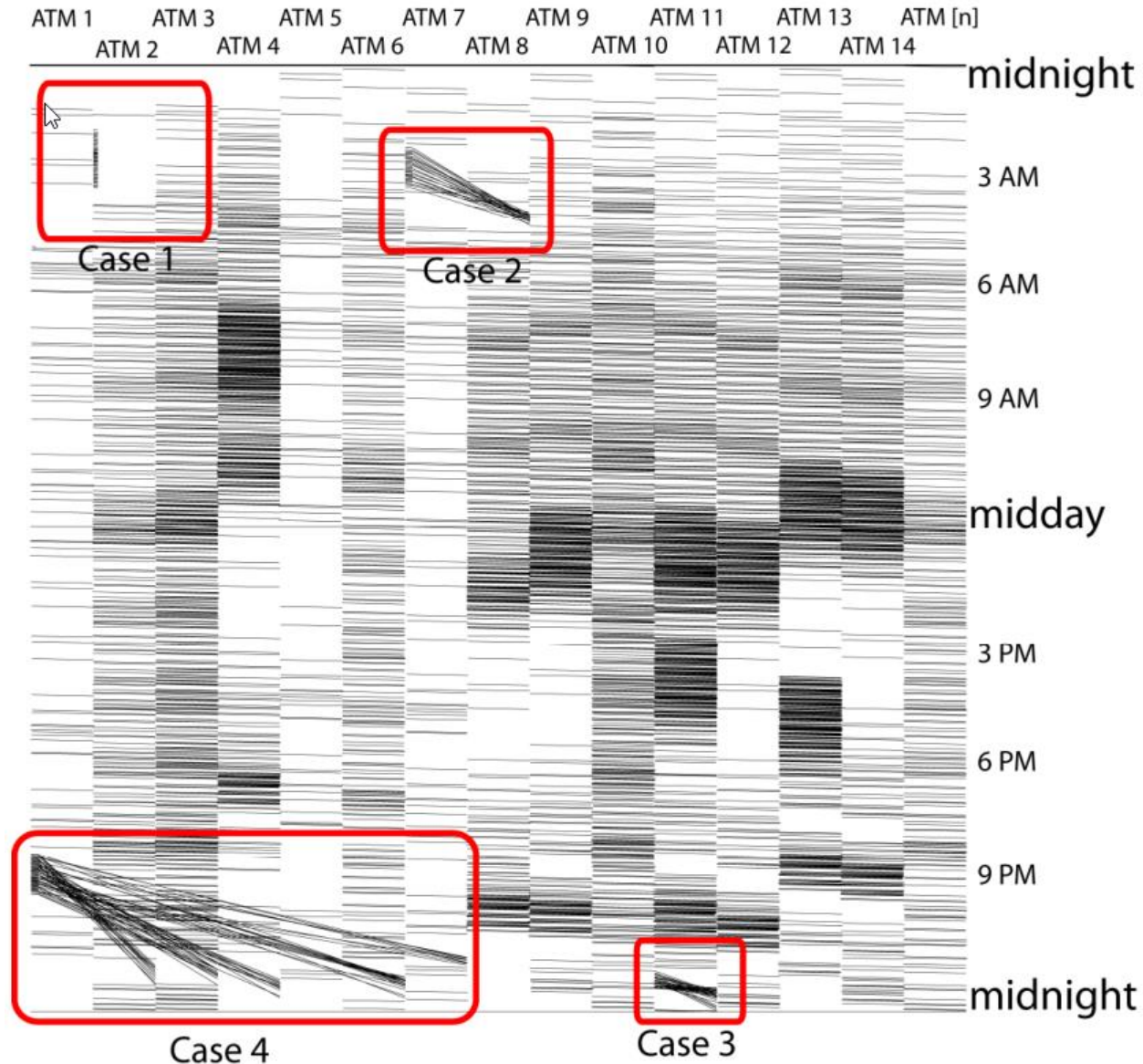
[Rubin]



# ATM Fraud Detection - Visualization of ATM Usage Patterns



# ATM Fraud Detection - Visualization of ATM Usage Patterns





**Many thanks for your attention**

