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# **Algorithm Design of Mobile Decentralized Computing Systems**

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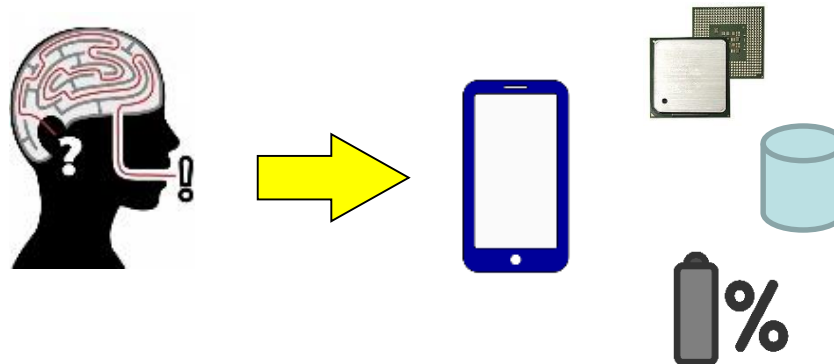
## **Acknowledgement**

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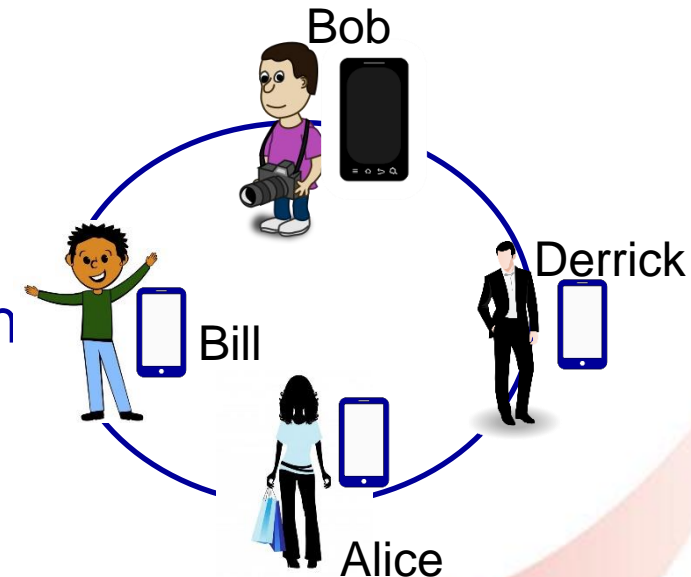
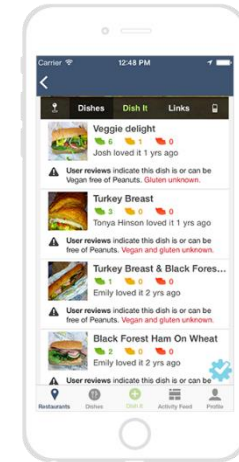
# Motivations

- Machine learning are prevalent, a number of them are on mobile devices and smartphones
- Yet, building Machine Learning model is data and resource intensive tasks
- Machine Learning needs a lot of **data**, **CPU**, memory, and **energy** for training process



# Use Case

- Bob travels to Singapore from the U.S.
- Bob meets with his local friends, Bill, Derrick, and Alice living in Singapore
- Bob has food, shopping, entertainment, recommendation app
- Bob wants to “re-train” his recommendation app by using only local data from his friends’ smartphones (location tag, promotion info, advertisement, photo, etc.)

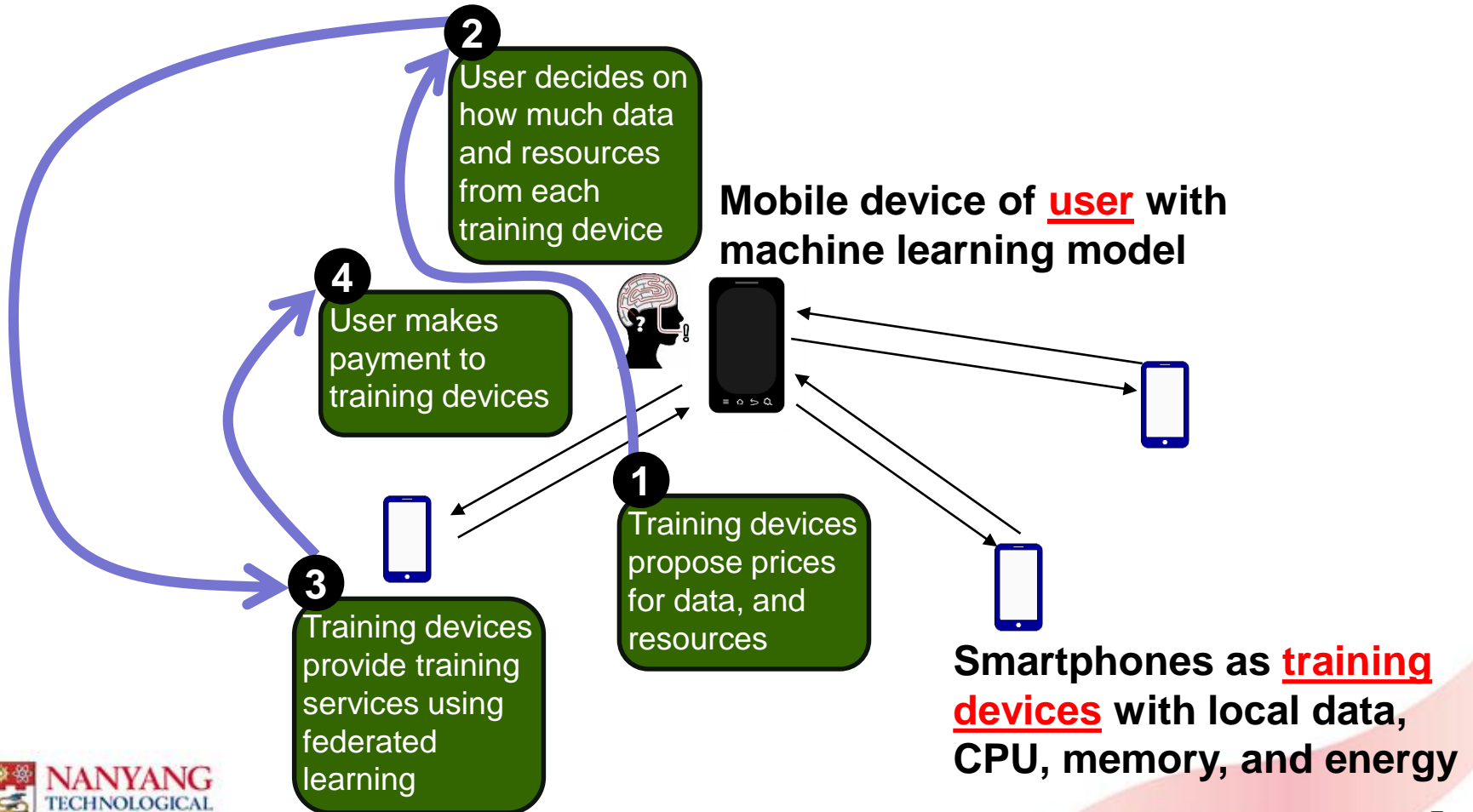


# Objectives

- To develop resource management algorithms for decentralized computing systems to support distributed mobile machine learning
- To introduce incentive mechanisms for the machine learning in decentralized computing systems, i.e., smartphones
  - Joint data and (mobile) decentralized resource allocation
  - Pricing and payment
- To apply the algorithms and incentive mechanisms with real machine learning algorithms, e.g., recommendation app

# Resource Management and Incentive Mechanism

- Steps



# Expected Outcomes

- Analytical model for the resource management algorithms for decentralized computing systems
- A demo real machine learning application