

Challenges for Rough Sets and Granular Computing

Guoyin Wang

Institute of Computer Science & Technology

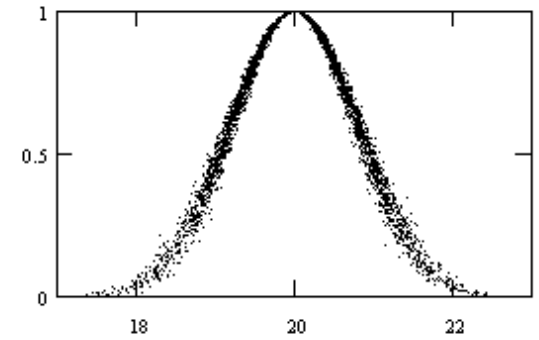
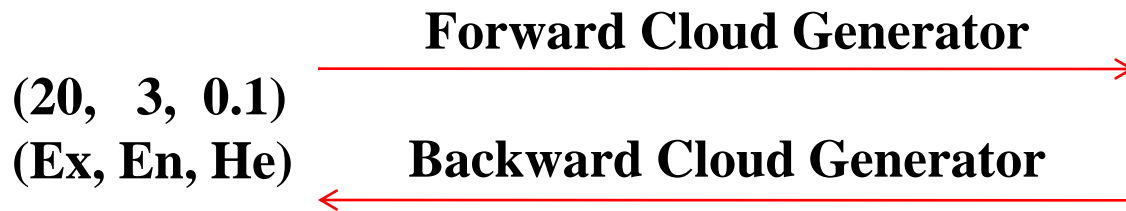
Chongqing University of Posts and Telecommunications

WANGGY@IEEE.ORG

1. Granulation

- **Granule (concept) generation from data.**
- **Thinking and reasoning with both granules and data.**
- **Solution: Granular Computing Based on Cloud Model.**

- **Cloud model: a cognition model of uncertainty with qualitative and quantitative bidirectional transformation.**
- **Granules(concepts) could be extracted from data using the backward cloud generator automatically.**
- **Data could be generated automatically from a granule (concept).**



ID	Name	Birth date

qualitative concept

transformation

quantitative value³

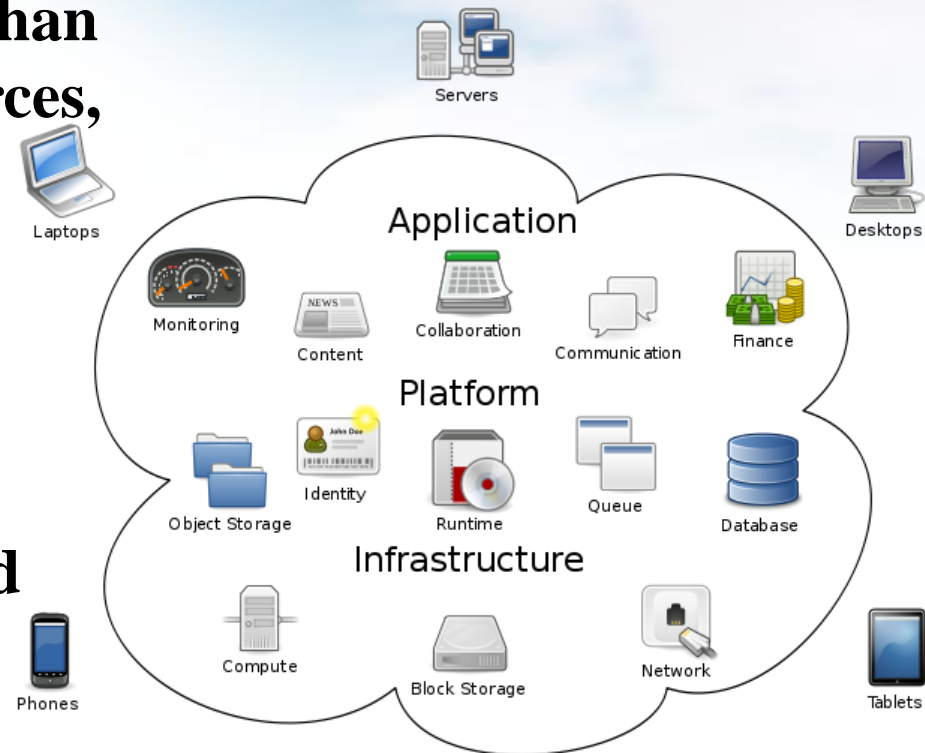
2. The generalization of rough set reduction

- **Reduction leads to over fitting (over training) in the training samples space.**
- **Rough sets characterize the ambiguity of decision information systems, but the randomness is not studied.**
- **Cloud model integrates both randomness and ambiguity.**
- **Solution: Extend rough set model through combining rough set and cloud model. Cloud Rough Set?**

3. Cloud Computing with Granular Computing

➤ Cloud computing is the delivery of computing as a service rather than a product, whereby shared resources, software, and information are provided to computers and other devices as a utility (like the electricity grid) over a network (typically the Internet).

➤ Cloud Computing Model based on GrC?



Cloud Computing

4. Data mining: How to extract the real knowledge existed in data and keep it unchanged?

- **3DM: Domain-oriented Data-driven Data Mining
---- Mining Uncertain Knowledge from Data
in the View of Knowledge Translation**
- **Data-driven Propositional Default Rule Generation**
- **Data-driven Decision Tree Pre-pruning**
- **Data-driven Knowledge Acquisition Based on Concept Lattice**
- **Data-driven Variable Precision Rough Set**

Thanks!
Comments?