

AccountTrade:  
Accountability Against  
Dishonest  
Big Data Buyers and Sellers

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# Abstract

- ▶ In this paper, a set of accountable protocols de-noted as AccountTrade is proposed for big data trading among dishonest consumers.
- ▶ For achieving secure the big data trading environment, AccountTrade achieves book-keeping ability and accountability against dishonest consumers throughout the trading (i.e., buying and selling) of datasets.
- ▶ We investigate the consumers' responsibilities in the dataset trading, then we design AccountTrade to achieve accountability against dishonest consumers that are likely to deviate from the responsibilities.
- ▶ Specifically, a uniqueness index is defined and proposed, which is a new rigorous measurement of the data uniqueness for this purpose.

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- ▶ Furthermore, several accountable trading protocols are presented to enable data brokers to blame the misbehaving entities when misbehavior is detected.
- ▶ The accountability of AccountTrade is formally defined, proved, and evaluated by an automatic verification tool as well as extensive simulation with real-world datasets.
- ▶ Our evaluation shows that AccountTrade incurs at most 10KB storage overhead per file, and it is capable of 8–1000 concurrent data upload requests per server

# Existing

- ▶ One of the major concerns is that we do not have accountability in the digital data trading.
- ▶ The concerns are particularly huge due to the non-physical nature of the digital dataset – replication and delivery are almost costless when compared to physical commodities.
- ▶ Concerns arise at the broker side: data owners worry that brokers may illegally disclose or resell the datasets they outsourced to the brokers.
- ▶ On the other hand, concerns arise at the consumer side as well: dishonest consumers may illegally resell the purchased datasets.

# Disadvantage

- ▶ we do not have accountability in the digital data trading. The concerns are particularly huge due to the non-physical nature of the digital dataset – replication and delivery are almost costless when compared to physical commodities
- ▶ data owners worry that brokers may illegally disclose or resell the datasets they outsourced to the Brokers
- ▶ concerns arise at the consumer side as well: dishonest consumers may illegally resell the purchased datasets.

# Proposed

- ▶ Propose a suite of accountable protocols, denoted as AccountTrade, for big data trading hosted by data brokers. AccountTrade enables brokers to attain accountability against dishonest consumers throughout the trading by detecting their misbehavior.
- ▶ The trading-related misbehavior defined in this paper includes tax evasion, denial of purchase, and resale of others' datasets.
- ▶ Note that we do not try to detect idea-wise plagiarism (e.g., novels with similar plots, images taken at the same scenery spot, videos taken with similar angles) because originality is a subjective factor that is hardly decidable even by human.

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- ▶ Instead, we propose to detect the blatant copy (not an exact copy) in the datasets uploaded by owners, by detecting whether the given datasets are derived from others that have been uploaded before.
- ▶ Notably, the fuzzy copy-detection in table-type datasets or JSON-like datasets has not been studied yet to the best of our knowledge, and AccountTrade is the first to propose a feasible mechanism.

# Advantage

- ▶ AccountTrade which guarantees correct book-keeping and achieves accountability in the big data trading among dishonest consumers
- ▶ AccountTrade blames dis-honest consumers if they deviate from their responsibilities in data transactions

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# HARDWARE REQUIREMENTS

- ▶ Processor – Pentium -III
- ▶ Speed – 1.1 Ghz
- ▶ RAM – 256 MB(min)
- ▶ Hard Disk – 20 GB
- ▶ Floppy Drive – 1.44 MB
- ▶ Key Board – Standard Windows Keyboard
- ▶ Mouse – Two or Three Button Mouse
- ▶ Monitor – SVGA

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# SOFTWARE REQUIREMENTS

- ▶ Operating System : Windows 8
- ▶ Front End : Java / DOTNET
- ▶ Database : Mysql / HEIDISQL

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# Conclusion

- ▶ This paper presents AccountTrade which guarantees correct book-keeping and achieves accountability in the big data trading among dishonest consumers. AccountTrade blames dishonest consumers if they deviate from their responsibilities in data transactions. To achieve accountability against dishonest sellers who may resell others' datasets, we presented a novel rigorous quantification of the dataset uniqueness - uniqueness index - which is efficiently computable. We formally defined two accountability models and proved them with ProVerif and theoretic analysis, and we also evaluated the performance and QoS using real-world datasets in our implemented testbed

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