# Buyer Fraudulence in Peer-to-Peer eCommerce: Building Tools for Alleviation

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# What is Peer-to-Peer eCommerce?

- P2P
  - ☐ Decentralized network,
  - ☐ Nodes are both suppliers and consumers of resources
- C2C - Consumer to Consumer
- <u>In this Study:</u>

# What type of Fraudulence are we dealing with?

- **Buyer fraudulence**, as opposed to **seller fraudulence**
  - ☐ Email Spoofs
    - Fake **PayPal**
    - Fake **Ebay**
    - Fake **Wire Transfer** or **Bank**
  - ☐ "**Stories**" through Email or Text Message

**ebay** eBay sent this message to Benjamin Horne (benhorneitpro)

Your registered name is included to show this message originated from eBay. Learn more.

## Congratulations, Your Payment Has Been Confirmed!

Dear Benjamin Horne (bdh.research@yahoo.com)

We wish to inform you that PayPal Just contacted us on your payment approval, to transfer your payment of **$4,547.99 USD** which was paid for by Mrs Elizabeth Garcia We want to inform you that this payment has been verified and confirmed by us with PayPal, and we advise you should go-ahead and carry out the shipment of your item to your buyer's given destination and keep us updated as soon as you carry out the shipment.

| Item n° | Description | Quantity | Price | Amount |
|---|---|---|---|---|
| 271420908616 | Apple iMac 21.5" Desktop (May, 2011) - Customized | 1 | $3,547.99 | $3,547.99 |

Subtotal : $3,547.99

Standard Int'l Shipping : $100.00

**Total : $4,547.99 USD**

We want to also bring to your notice that we have already taken full guarantee on this transaction and be informed that

# eBay has tried…

- Reputation/Feedback System
- Established Trust and Safety Department
- Awareness Initiatives
- Top-Rated Seller Schemes
- Constant Revision of Polices and User Agreements
- Paypal Money Delays

# What has been proposed?

- Anomaly detection schemes
- Data mining schemes
- Agents based-trust management schemes
- Social Network Analysis and Classification Tree Approaches
- Additions to the Reputation System
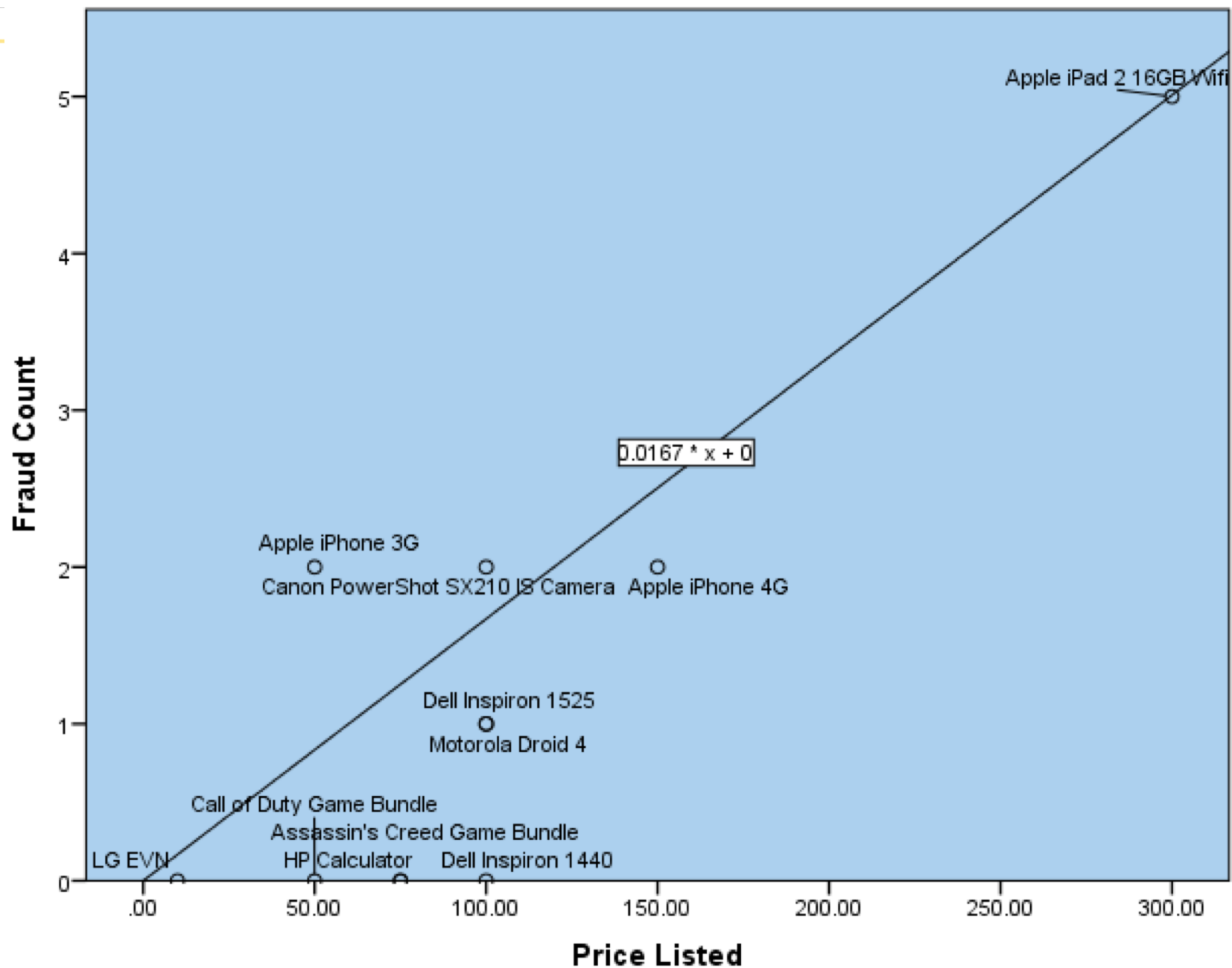- **Conceptually formalized**

# Questions Proposed

- What are the traits and **commonalities** of **typical** buyer **fraudulence**?

- Can a **simple third party tool** be built to **alleviate common** buyer **fraudulence** based on this data?

# Methodologies

- Selling data collected during a **9 week** period
- Specific **1 Week** Selling test
- **Literature Review** and Comparison of Data
- Built a **tool** based on this data

Scatter plot of Fraud Count versus Price Listed with fitted line 0.0167 * x + 0

Labeled data points:
- Apple iPad 2 16GB Wifi
- Apple iPhone 3G
- Canon PowerShot SX210 IS Camera
- Apple iPhone 4G
- Dell Inspiron 1525
- Motorola Droid 4
- Call of Duty Game Bundle
- Assassin's Creed Game Bundle
- LG EVN
- HP Calculator
- Dell Inspiron 1440

## Mrs Elizabeth Garcia Paid Through PayPal

**Dear** Benjamin Horne

> Mrs Elizabeth Garcia
> Mrs Elizabeth Garcia (garciaelizabeth402@yahoo.com) sent you an Instant Payment for an eBay item through PayPal.

Sa

*COUNTRY.... NIGERIA*
*ZIP CODE.... 23401*

In regards of this please remember to email me the tracking number and also to PayPal today immediately this item has been shipped and do handle the item with care when sending.

**Thanks and Regards**

On Monday, March 10, 2014 1:33 PM, eBay <ebay@ebay.com> wrote:

eBay

eBay sent this message to Elizabeth Garcia (elizgarc_hqhwetkqi).
Your registered name is included to show this message originated from eBay. **Learn more**.

## Invoice

Dear elizgarc_hqhwetkqi,

Thank you for shopping on eBay! Your total amount due is $3,617.78. More details about your purchase are included below.

| Item # | Item Title | Quantity | Price | Amount |
|--------|-----------|----------|-------|--------|
| 271420908616 | Apple iMac 21.5" Desktop (May, 2011) - Customized | 1 | $3,547.99 | $3,547.99 |

| | |
|---|---|
| Subtotal: | $3,547.99 |
| Shipping and handling via UPS Ground: | $69.79 |
| **Total:** | **$3,617.78** |

| | | | | | |
|---|---|---|---|---|---|
| 1 | 2714209 08616 | Apple iMac 21.5" Desktop (May, 2011) - Customized | $3,547.99 | $3,547.99 | |
| | | | Subtotal: | $3,547.99 | |
| | | | Shipping: | $100.00 | |
| | Currency is in DOLLAR'S (USD) | | **Total:** | $4,547.99 | USD |

# Salient Findings (Keywords)

# What is FraudFindr?

- **Web application** built to **check** peer-to-peer eCommerce transactions **for fraudulent** or deceptive **behavior**

- Built with **end users** in mind

- Simple **Copy** and **Paste** Interface

- HTML, CSS3, JavaScript, JQuery (Vegas and Reveal), **PHP**

# How does is FraudFindr find fraud?

- Checks:
  - Full Email Headers
  - Email Bodies
  - Text Messages
- Checks Additional Information about Transaction

# Full Email Headers

- Parses input
- Finds return path
- Compares email in return path to list of good domains
- User's can add specific domains such as their bank

# Email Body and Text Messages

- Keywords
  - Search parsed input for common keywords found in emails and text messages
  - Evenly distributed weight
  - Weight added to "give-a-way" words
- Phrases
  - Same Process, but all weights are evenly distributed

# Email Body and Text Messages

- "Haste" Words
  - ☐ Algorithm Checks for duplicates of words were duplicates make the document more relevant.
  - ☐ Relevance is **not proportional** to Frequency
  - ☐ Increment by Log base 3 of frequency + 1

# FRAUDFINDR
## THE STATISTICAL SCAM FILTER

# DEMO

# Future Work

- Full Implementation of the **Bag of Words Model**
- Full **Responsive** and Mobile Design
- Continued Tested and **Accuracy Updates**

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