RSAConference2018

Singapore | 25–27 July | Marina Bay Sands

#RSAC

SESSION ID: SEM-W01E

BRINGING AI TO THE CYBERSECURITY BATTLE

Vikas Desai

Cybersecurity Advisor

https://sg.linkedin.com/in/vikasdesai

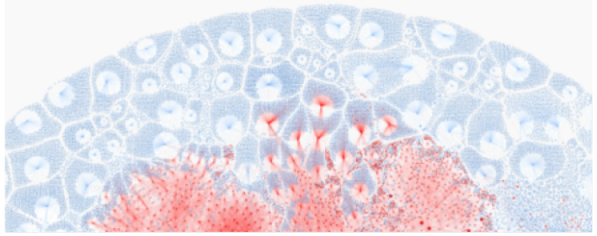
Uses of AI in Security

Predictive Analytics

- **Approach**: Model behaviors and identify emerging and past threats and risks
- **Applications**: Network, user, endpoint, app and data, cloud
- **Examples**: Beaconing, DNS analytics, user behavior

Intelligence Consolidation

- **Approach**: Curation of intelligence and contextual reasoning
- **Applications**: Structured and unstructured (NLP) data sources
- **Examples**: Intelligence Feeds, Augmented Intelligence



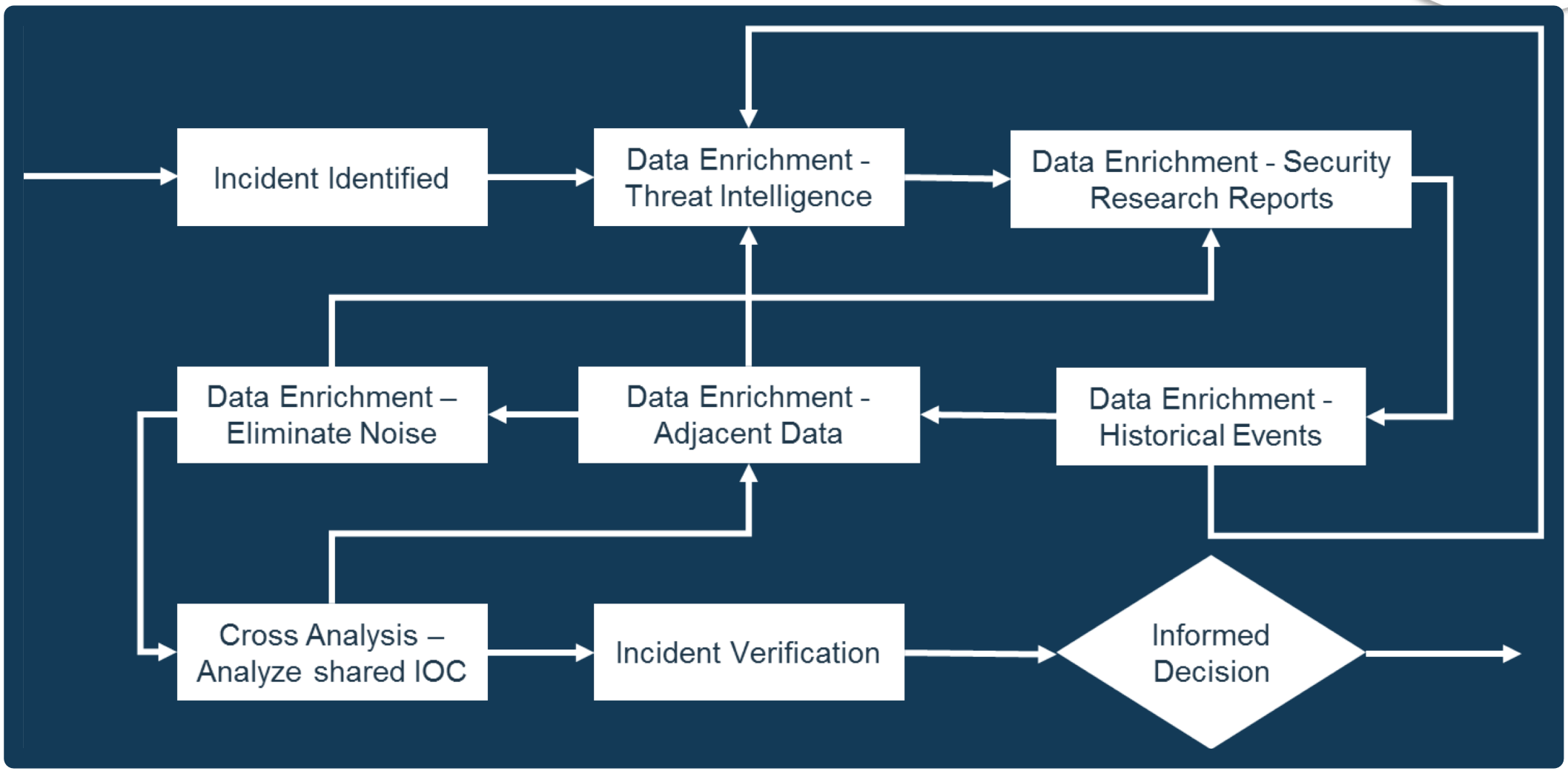
Trusted Advisors & Response

- **Approach**: Reason about security events for triage and response
- **Applications**: Cognitive SOC analyst, orchestration, automation and digital guardian
- **Examples**: SoC Augmentation, SOAR applications

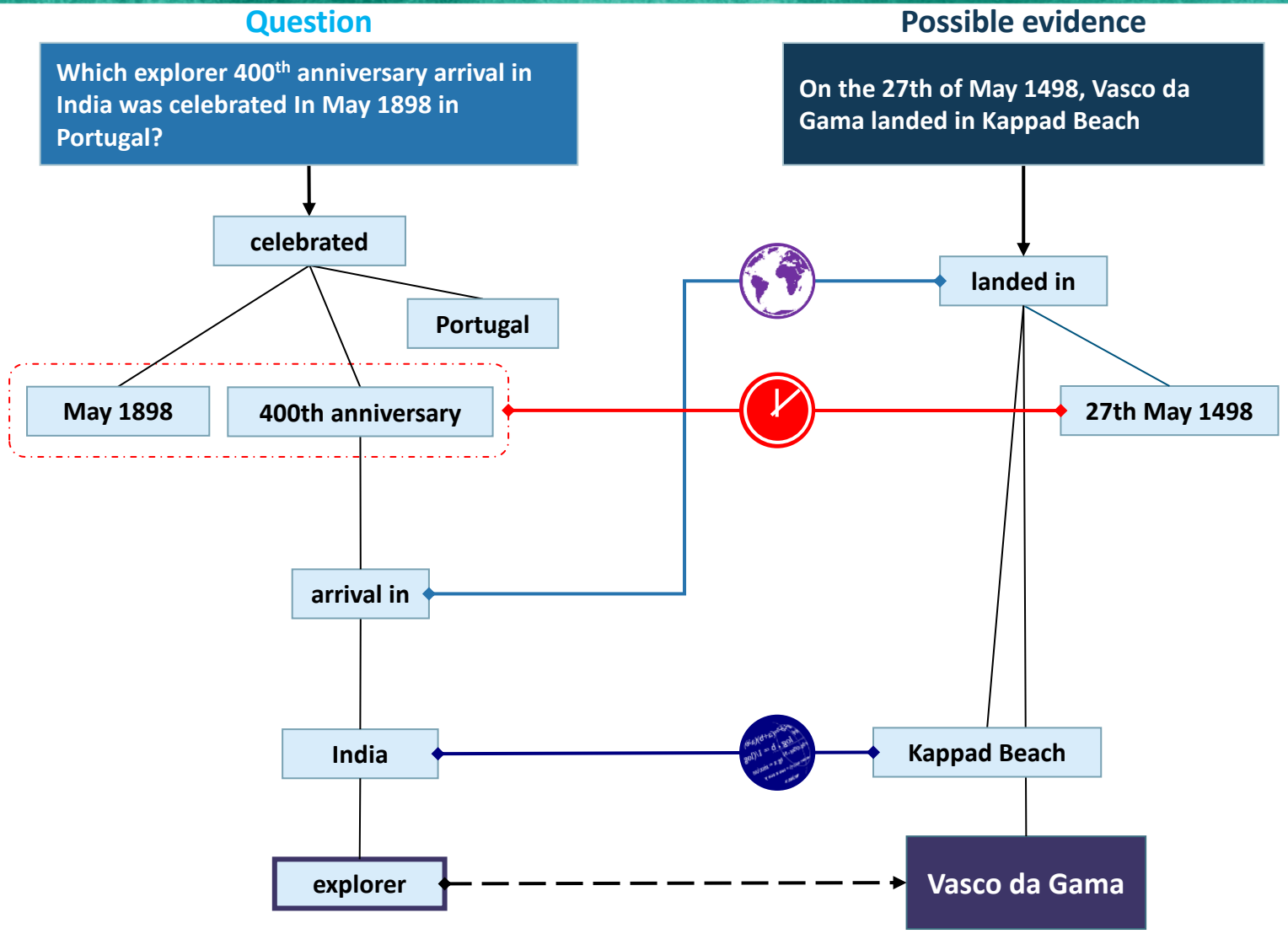
AUGMENTED INTELLIGENCE

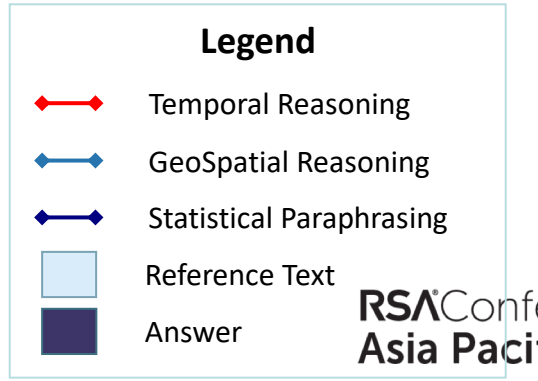
Trusted Advisors & Response

Incident Investigation Today



So What Do we Need?





AI for Cybersecurity

Ingestion

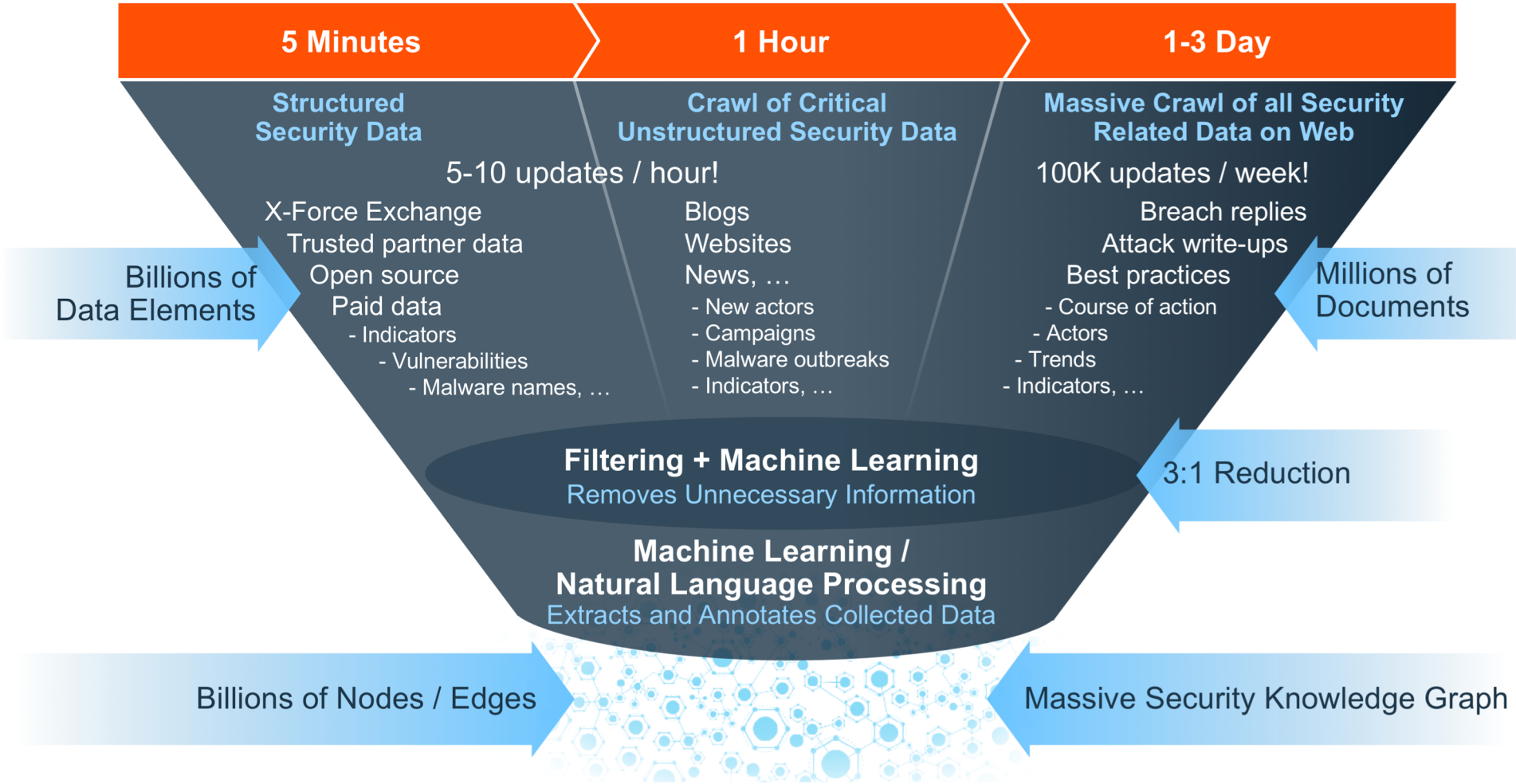
Classification and Normalization

Natural Language Processing

Training and Learning

Knowledge Graphs

Ingestion – Building the knowledge



Natural Language Processing / Understanding

User Generated Content: *"What's interesting about TSPY_BANKER.YYSI is that it uses the social media network Pinterest in its command and control (C&C) routines. The comments, which look something like "104A149B245C120D," are decoded (by replacing letters with a dot) and the result is an IP address for the server hosting the phishing page. This tactic allows cybercriminals to quickly change the location of their servers in order to avoid detection, Trend Micro said in a blog post…the attackers leveraged exploits for two patched Internet Explorer vulnerabilities, CVE-2013-2551 and CVW-2014-0322"*

Watson understands: *TSPY_BANKER.YYSI [MALWARE] it [MALWARE REFERENCE] its [MALWARE REFERENCE] command and control (C&C) routines. Instead of contacting a C & C server, the Trojan [MALWARE] accesses comments …which look something like "104A149B245C120D" [INDICATOR].*

Site : https://www.securityweek.com/banking-trojan-abuses-pinterest-cc-routines

Training and Learning

Cognitive SoC

Accelerated Analysis

- Uses AI to analyze real-time incidents for triage
  - Automatically investigates evidence for an alert or anomaly against Watson and applies ‘reasoning’ to identify the likely threat
- Gathers external and internal threat indicators from alert
- Performs external (threat intelligence research) and internal research on indicators and entities (hash, domain, IP, users, filename etc.)
- Highlights the existence and identity of threat or outliers
- Offers natural language search bar for security only information to speed up assessment

Intelligent Investigation

- Identifies if communication with threat has occurred or was blocked
- Highlights if malware has executed
- Identifies criticality of systems impacted in incident and shows high value assets
- Gives visibility to higher priority risks and threats from insiders
  - Integrated with User Behavior Analytics (UBA) app to show user’s risk scores
  - Reveals previous behaviors and actions of users
- Connects other threat entities from original offense to show relationship
- Provides input for ad-hoc investigation against collections of users and entities

Faster Response

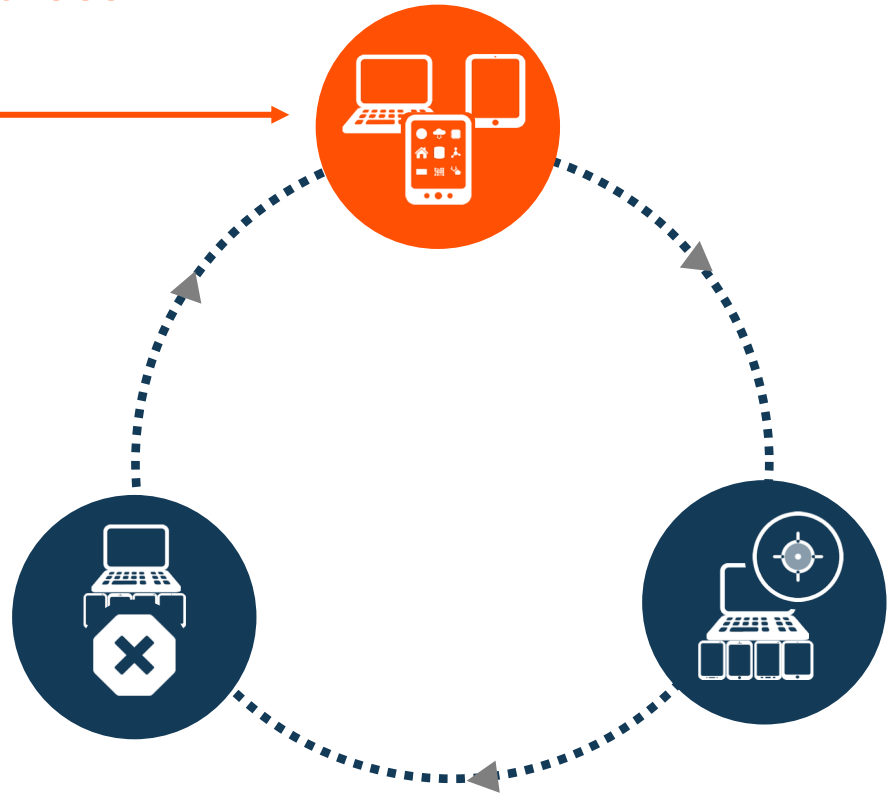
- Provides pertinent information to take action on escalation
- Performs automatic hunting for indicators
- Exports threat and indicators to IR process for remediation and/or blocking
- Automatically adds additional discovered threat indicators to watch lists to reduce risk of missing threats

USER BEHAVIOR

Predictive Analytics

The connected world has created new challenges

Customers want convenient mobile, online and cross-channel access



Threat mitigation can impact customer experience

New, faster transactions can create new risks

Customers' Value Drivers – Predictive Analytics

- Improve Customer Experience
  - Reduce user friction
  - Proactive fraud prevention
  - Faster dispute resolutions
- Strengthen authentication
  - Detection of Account Take Over. Remote Access Tools…
  - Real-time fraud detection
  - Continuous and Invisible passive user authentication
- Cost Reduction
  - Improve true positive detection rates (less fraud)
  - Reduce false positive detection rates (less work)
  - Faster fraud dispute resolutions (less fraud and less work)

Let's look at Keystroke Dynamics

Key Usage

Pattern Attributes Collection(JS Collectors)

- Capitalized letters(shift/caps lock)
- Changes(Delete/Backspace)
- Control Combinations(language)
- Traversing fields
- Pasting(Ctrl-V/right click)
- General Movements

Key Strokes

Pattern Attributes Collection(JS Collectors)

- Typing speed
- Dwell Time
- Flight Time
- Digraph patterns
- Trigraph Patterns
- Total Keystrokes

Let’s look at Keystroke Dynamics

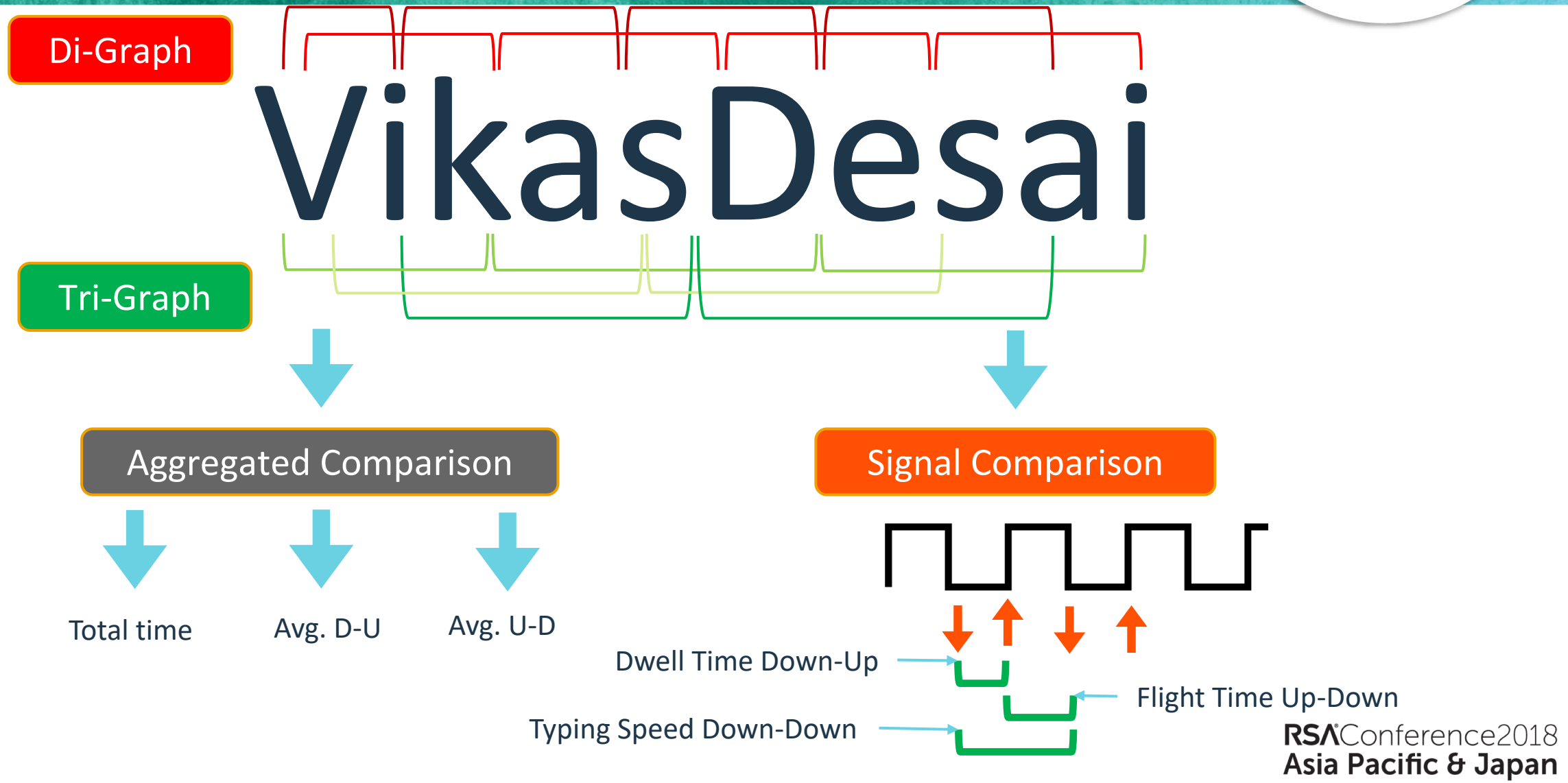
User Name

Password

VikasDesai

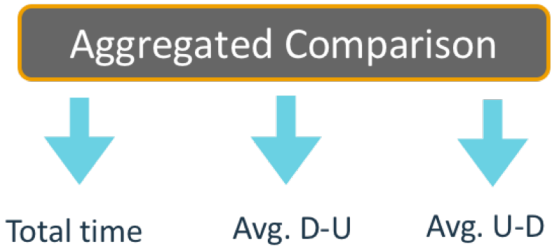
Security2018

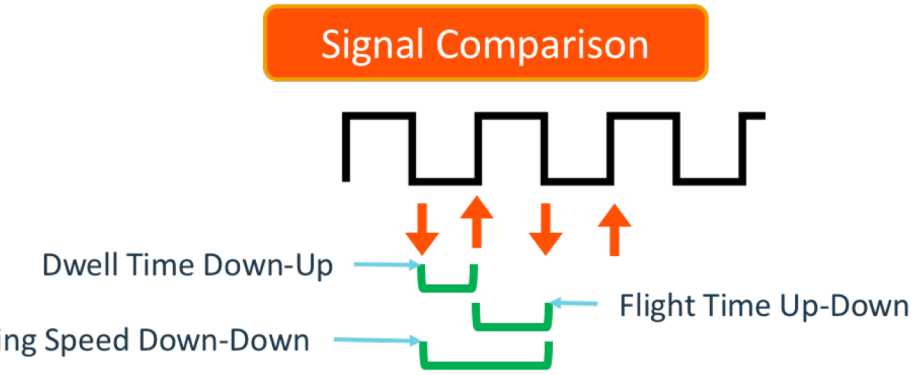
Let's look at Keystroke Dynamics



Feature Engineering

- Dwell Time – The amount of time a key stays pressed
  - Down-Up (DU)
- Flight Time – The amount of time needed to release the previous key and press the next key
  - Up-Down (UD)
- Typing Speed – The amount of time between 2 key presses
  - Down-Down (DD)
- Average Dwell time
- Average Flight Time
- Average Typing Speed





DEMO

Keystroke Dynamics

https://vikasdesai.github.io/keystroke-dynamics/

What next?

Learn + Explore = Apply

- Educate yourself
- Stay informed
- Leverage AI to secure yourself

https://vikasdesai.github.io
https://www.ibm.com/security/artificial-intelligence
https://github.com/IBM/adversarial-robustness-toolbox