VAST 2009 Challenge

The VAST 2009 Challenge Co-chairs

Georges Grinstein, University of Massachusetts Lowell
Catherine Plaisant, University of Maryland
Jean Scholtz, Pacific Northwest National Laboratory
Mark Whiting, Pacific Northwest National Laboratory

The Challenge Committee wishes to thank

- VAST and VisWeek organizers
- All of the VAST 2009 Challenge Participants
- Co-developers of the VAST 2009 Challenge Scenario and Datasets: Jereme Haack, Carrie Varley, and Ian Roberts
- “Challenge Week” Judges: Jereme, Carrie, Cindy Henderson, Andrew Canfield (Mercyhurst)
- All UMass and UMd students who supported the project
  - Loura Costello, Shawn Konecni, Heather Byrne, Adem Albayrak, Swetha Reddy
- Triage analysts and judges

Thanks to the Challenge Sponsors

- **U.S. Department of Homeland Security and the National Visualization and Analytics Center (NVAC)**
- **National Science Foundation**

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Outline

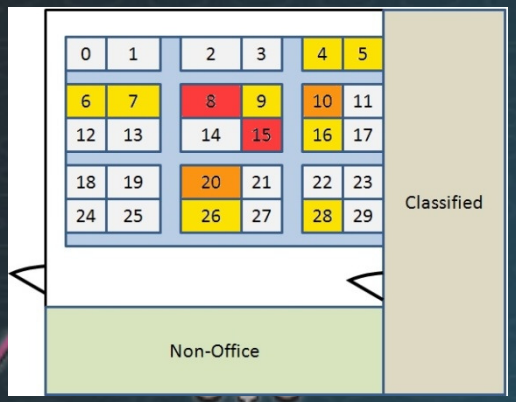
- Overview and Structure of the 2009 Challenge
- Description and Award Winners for the Mini-Challenges and the Grand Challenge
- Questions, Plans for Next Year

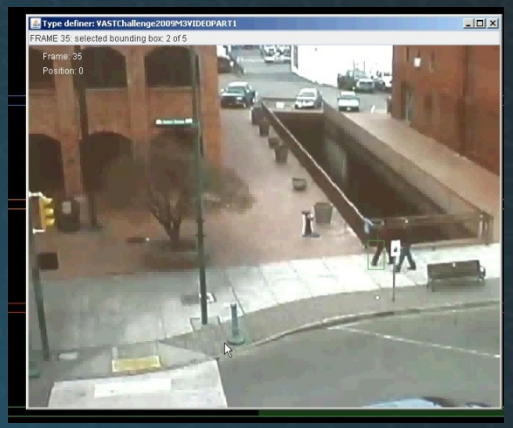
VAST 2009 Challenge

- Similar format to last year
  - 3 Mini-Challenges: one overarching scenario
    - Each has own dataset and tasks
    - Teams may enter one or more
  - 1 Grand Challenge
    - Analyze all 3 datasets – Integrate to answer
  - Awards presented for outstanding visual analytic qualities of the entries
  - Both visualization and analysis awards

The VAST 2009 Challenge

Demonstrate the visual analytics capabilities of your tools against an invented scenario, defined tasks, and supplied datasets. The challenges required a) Cyber Traffic Analytics, and b) Social Network Analytics, and c) Video Analytics





Challenge Goals

- Support researchers to move visual analytics discoveries and applications into practice through an innovative evaluation forum
- Help in developing, testing and automating metrics and evaluation methods for visual analysis environments

Continued Strong Interest

- Over 400 registered downloads for the 2009
  - over 575 for 2008 data
  - over 164 for 2007 data
- 49 submissions
  - 22 Cyber Traffic Analysis
  - 17 Social Network Analysis
  - 5 Video Analysis
  - **5 Grand Challenge**
- 28 organizations
- 18 student teams
- 13 countries

Challenge Scenario
A fictitious cyber security event

Scenario: A U.S. embassy employee in Flovania leaked important information to a Flovanian criminal organization, with implications that other countries may be involved.

Task: Discover the employee's identity, the structure of the criminal organization's network and when and what occurred at their meetings

Data: Three data sets, one per mini-challenge

- badge and network traffic within the embassy
- social network data (including geospatial information) about the group receiving information
- video data from cameras located near the embassy

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Challenge Scenario: the tasks

- Participants in each Mini Challenge were required to analyze a single data set
- Participants could enter more than one
- Participants in the Grand Challenge were required to pull together information from all three data sets to support their hypotheses about the entire scenario

Special Contributions to the VAST Challenge Contest

- Chris North, Alex Endert - Virginia Tech

Judging - Criteria

- Accuracy of the answer
- Process utility in getting to the answer
- Quality of interactive visualizations
- Creativity and innovation
- Quality of the analytic product (Grand Challenge and detailed answers for mini challenges)

Judging

- Quantitative evaluation through measures of accuracy
- Qualitative evaluation for mini challenges through external reviews (Triage)
  - Judges were recruited from the visual analytic research community and professional analysts for the first round of reviews
  - Each entry was to be reviewed by 1 analyst and 2 visualization researchers
  - Judges asked to review a max of 4 entries
  - Entries were judged based on the process descriptions submitted by the teams (including screen shots and videos)
  - Judges gave ratings for usefulness, efficiency and intuitiveness of the analytic process used, the visualizations, the interactions with the visualizations and the novelty of the approach
- Final decisions made by challenge committee + analysts in face to face meeting

Awards and Incentives

- 23 awards to 16 teams
- Award recipients were invited to publish a paper in VAST proceedings
- All other participants were invited to contribute a paper for the VAST compendium
- All participants invited to a workshop at VAST
- All participants were able to view solutions and other submitted entries after the submission deadline

Awards

- Visualization awards
- Process awards
- Analysis awards
- System/Tool awards
- Ad-Hoc awards as appropriate

- Multiple awards per team were allowed

Visualization Awards

- Innovation – goes beyond usual visualization
- Quality – symbols, colors, layout, labels
- Utility – visualization clearly show useful information relevant to analysis

Analytic Process Awards

- Systematic process used
- Clear explanation including what was automated and what analyst did
- Clearly describes how tool capabilities and visualizations helped
- Is effective and efficient

- Note: video and text description are only source we have to judge this. Critical that these be clear and understandable

Analysis Awards

- Given based on analytic product (Grand Challenge) or detailed answer (mini-challenge)
- Clearly states assumptions
- Assumptions are reasonable
- Clear description of analysis process and results
- Differentiates between facts and analyst interpretations
- Results are justified by supporting evidence

Tool/System Awards

- Good support for a number of analytic techniques
- Easily modifiable
- Excellent utility
- Efficient

Challenge 1
Badge and Network Traffic

Badge and Network Traffic

- Dataset
  - A Proximity (prox) card log
    - Log contains employee #, date and time, location
    - Employees can enter building by following someone else (piggybacking)
    - Employees are not allowed to piggyback when entering classified area
  - A month's work of network traffic logs
    - Computer IP address, employee number, outgoing and incoming activity (destination site, request and response bytes, port number)
  - An office layout

Traffic Mini-Challenge

- Analytic Situation

  An embassy employee is suspected of sending data to an outside criminal organization from the Embassy
- Question 1
  - Identify which computer(s) the employee most likely used to send information to his contact including
    - when the information was sent
    - how much information was sent
    - where that information was sent
- Question 2
  - Characterize the patterns of behavior of suspicious computer use
  - Provide a Detailed Answer and a video showing how you conducted the analysis

In general

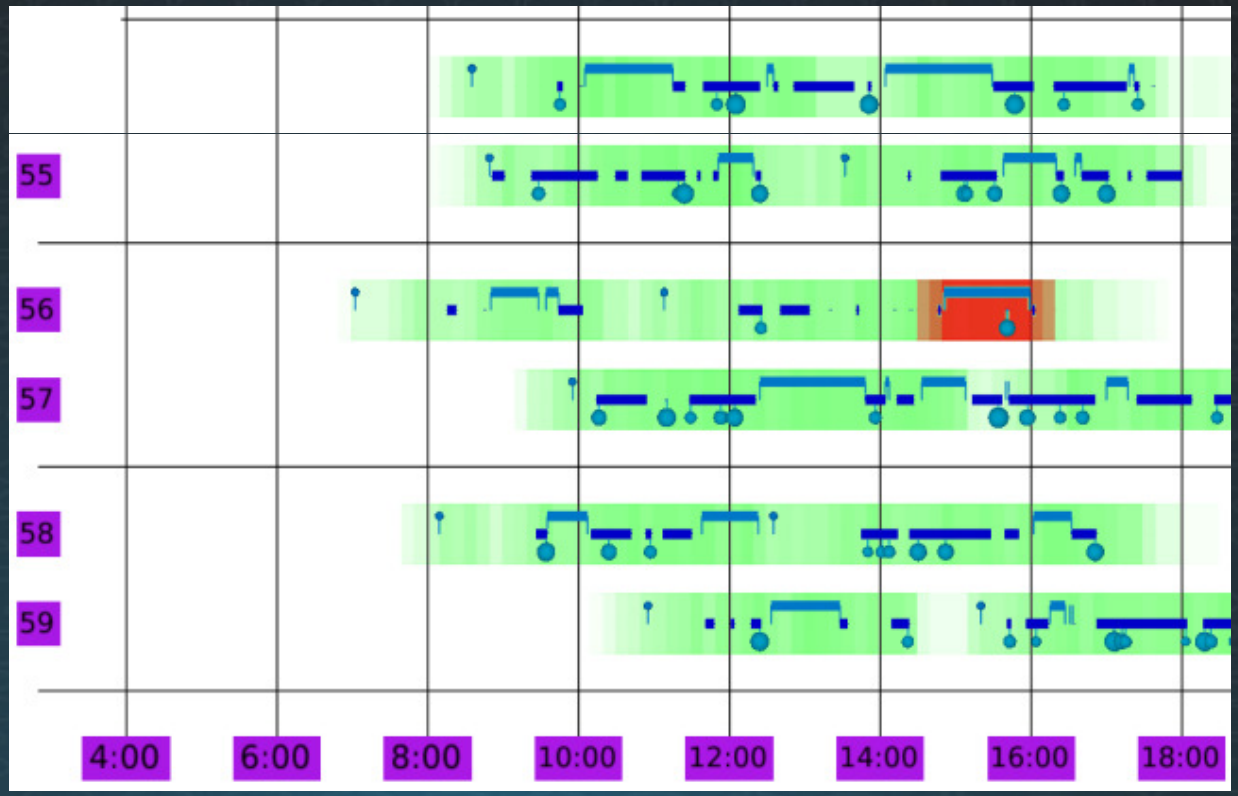
- Most found answer – or close
  - Piggy-back was the source of uncertainty in data
- Very innovative solutions
  - Visualizations involving time, space, and ip-related data, ~~even office layout~~
  - Alibi charts produced

Badge and Network Traffic Awards

Visualization Award

LaBRI, INRIA Bordeaux (student team)

Innovative Visualization and Excellent Description



Visualization Award

International Institute of Information Technology, Hyderabad (student team)

Intuitive Analytic Information Presentation

Portion of table

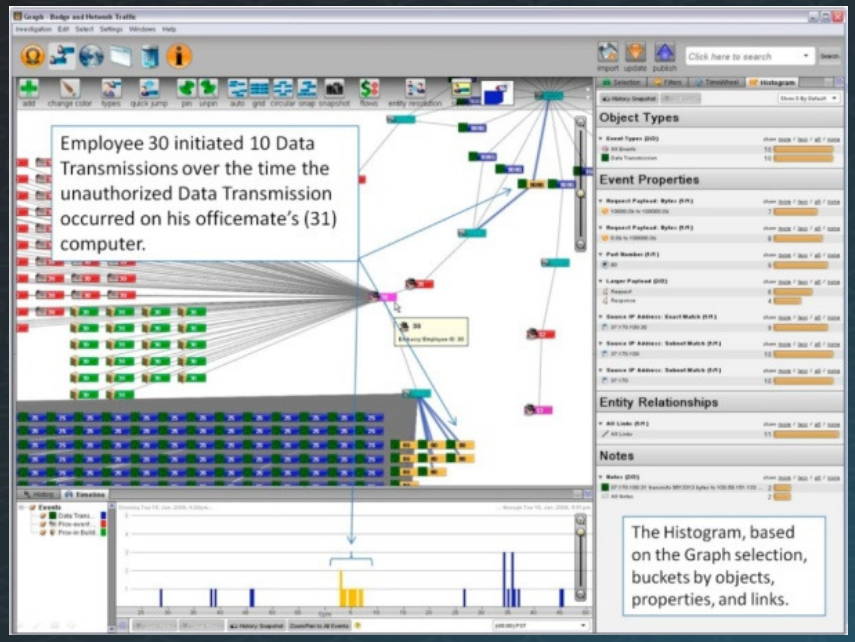
7.	37.170.100.56	1/29/200815:41	339.075055	WARA, Employee 57 is also in restricted area
8.	37.170.100.31	1/10/200814:27	293.2205243	WARA
9.	37.170.100.31	1/8/2008	17:01 727.291	35 employees had left after 17:00 (prox-out-classified)
10.	37.170.100.31	1/15/200817:03	664.1519	43 employees had left after 17:00 (based on prox-out-classified)
11.	37.170.100.18	1/17/200817:57	232.7596	38 employees had left after 17:00 (based on prox-out-classified)

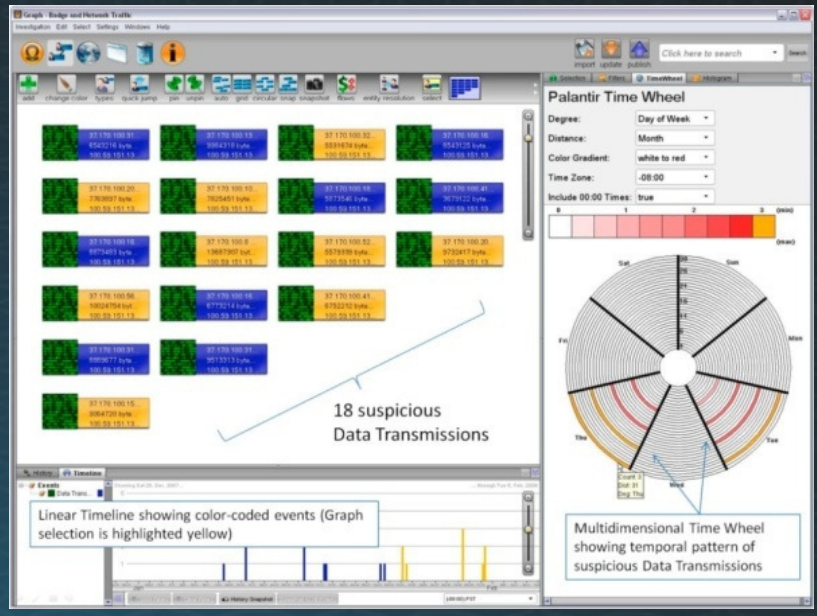
WARA- Web access from source ip while corresponding employee in restricted area

Visualization Award

Palantir Technologies

Intuitive Traffic Visualization and Video Description of the Analysis Process





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Visualization Award

HRL Laboratories

Intuitive Visual Presentation of Alibis

Best one screenshot of the solution

Location of individuals during suspicious network activity

UserID (0–29)

Date/Time	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
'08-Jan-2008 17:01:33'	0	0	1	0	0	0	0	1	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
'10-Jan-2008 14:27:12'	1	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	1	0	1	0	0	1	0	1	0	0	1	0
'10-Jan-2008 16:01:53'	1	0	0	0	0	1	1	1	0	0	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0
'15-Jan-2008 16:14:34'	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	1	0	1	1	0	0	0	1
'15-Jan-2008 17:03:29'	1	1	0	0	0	0	1	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0	1	1
'17-Jan-2008 12:12:10'	1	1	1	0	0	0	1	1	1	1	0	0	1	1	1	1	1	0	0	0	0	0	1	1	0	0	0	0	0	0
'17-Jan-2008 17:57:19'	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0
'22-Jan-2008 08:50:21'	0	1	1	1	1	0	1	1	0	1	1	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1	0	1	0	1
'22-Jan-2008 17:41:55'	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
'24-Jan-2008 09:46:34'	0	0	1	0	0	0	1	0	0	1	0	1	1	1	0	0	1	0	0	0	1	0	0	1	0	1	0	1	1	0
'24-Jan-2008 10:26:31'	0	0	0	0	0	0	0	1	0	1	0	0	1	0	0	1	0	0	1	0	0	0	1	0	0	0	1	1	1	0
'24-Jan-2008 17:07:34'	0	0	0	1	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	1
'29-Jan-2008 15:41:32'	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	1
'29-Jan-2008 16:08:10'	0	0	1	1	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0
'29-Jan-2008 16:38:06'	0	0	0	1	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	1	0
'31-Jan-2008 09:41:03'	1	1	1	1	0	0	1	0	0	0	0	0	1	1	0	0	0	1	0	0	1	0	0	0	0	1	0	1	0	0
'31-Jan-2008 13:10:23'	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	1	1	0	0	0	1	0	1	0	0	0	0	0	0	0
'31-Jan-2008 16:02:44'	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	0	0	1	0	1	0	0	0	0	1	0	0	0
Total	6	4	6	5	2	4	7	7	2	8	4	4	9	5	6	6	7	2	3	3	5	4	9	5	6	5	3	4	6	5

UserID (30–59)

Date/Time	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59
'08-Jan-2008 17:01:33'	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0
'10-Jan-2008 14:27:12'	0	1	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
'10-Jan-2008 16:01:53'	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0
'15-Jan-2008 16:14:34'	0	0	0	1	1	1	1	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0	1	0	1	0	0	0	0	1
'15-Jan-2008 17:03:29'	0	0	0	0	1	0	1	1	1	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	1	1	0	0	0
'17-Jan-2008 12:12:10'	0	1	0	0	0	1	0	0	0	1	1	1	0	1	0	1	0	0	0	1	1	0	1	1	0	0	0	0	0	0
'17-Jan-2008 17:57:19'	0	0	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	1	0	1
'22-Jan-2008 08:50:21'	0	1	1	1	1	0	0	1	1	0	0	0	0	1	0	0	1	1	1	1	1	1	1	1	0	1	0	1	0	1
'22-Jan-2008 17:41:55'	0	0	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	1	1	1	0	1	1	0	1	0	0	0	0
'24-Jan-2008 09:46:34'	0	1	1	1	0	0	0	1	0	0	0	1	1	1	0	1	0	1	1	0	0	0	0	0	0	0	1	1	0	1
'24-Jan-2008 10:26:31'	0	0	0	0	0	1	0	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
'24-Jan-2008 17:07:34'	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
'29-Jan-2008 15:41:32'	0	0	0	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	1	0	0
'29-Jan-2008 16:08:10'	0	0	0	0	0	1	0	0	1	0	1	1	0	0	0	0	0	0	0	1	0	1	1	0	0	1	0	0	1	0
'29-Jan-2008 16:38:06'	0	0	0	1	0	1	0	0	0	1	0	1	1	0	0	0	0	1	0	0	0	1	1	0	0	1	0	0	0	0
'31-Jan-2008 09:41:03'	0	1	1	0	0	0	0	1	0	0	0	0	0	1	0	0	0	1	1	1	0	0	1	0	0	0	0	1	1	1
'31-Jan-2008 13:10:23'	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	1	0	0	0	1	0	0	0	0	1	0	0	1	0	1
'31-Jan-2008 16:02:44'	0	0	0	0	1	1	0	0	0	1	0	0	1	1	0	1	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Total	0	5	5	5	5	8	4	7	7	5	4	6	4	8	1	4	2	6	5	11	4	4	8	4	3	8	4	6	4	8

Smaller numbers mean more likely to not have good alibi during suspicious activities.

Legend: Cells which contain 1 (and are shaded red) means the user was either not in the building or was in the classified area during the suspicious activity, and hence are less likely to be responsible for it.

Analytic Process Awards

Georgia Institute of Technology (student team)

Good Analytic Technique

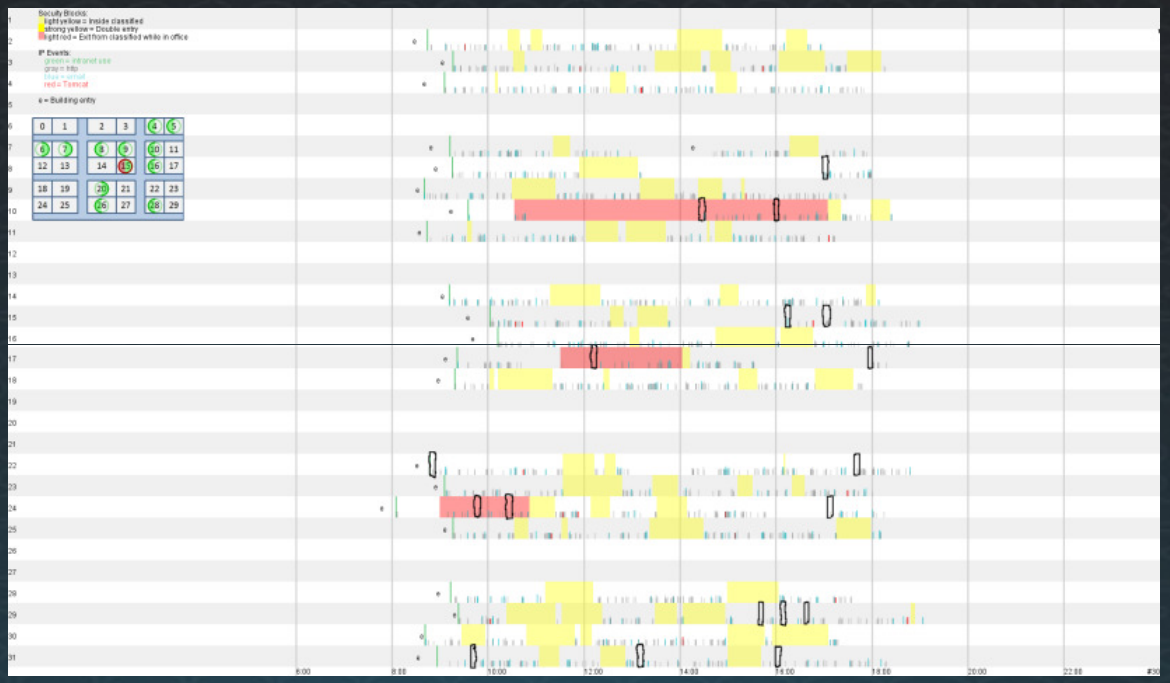
University of Konstanz (student team)

Excellent Analytic Technique Featuring Integration of Data Mining and Visual Analytics

Analysis Awards

University of California Davis (student team)

Good Clarity of Analysis Supported by Visuals



Vision Systems & Technology, Inc

Excellent Analysis Facilitated by a Customizable Toolset

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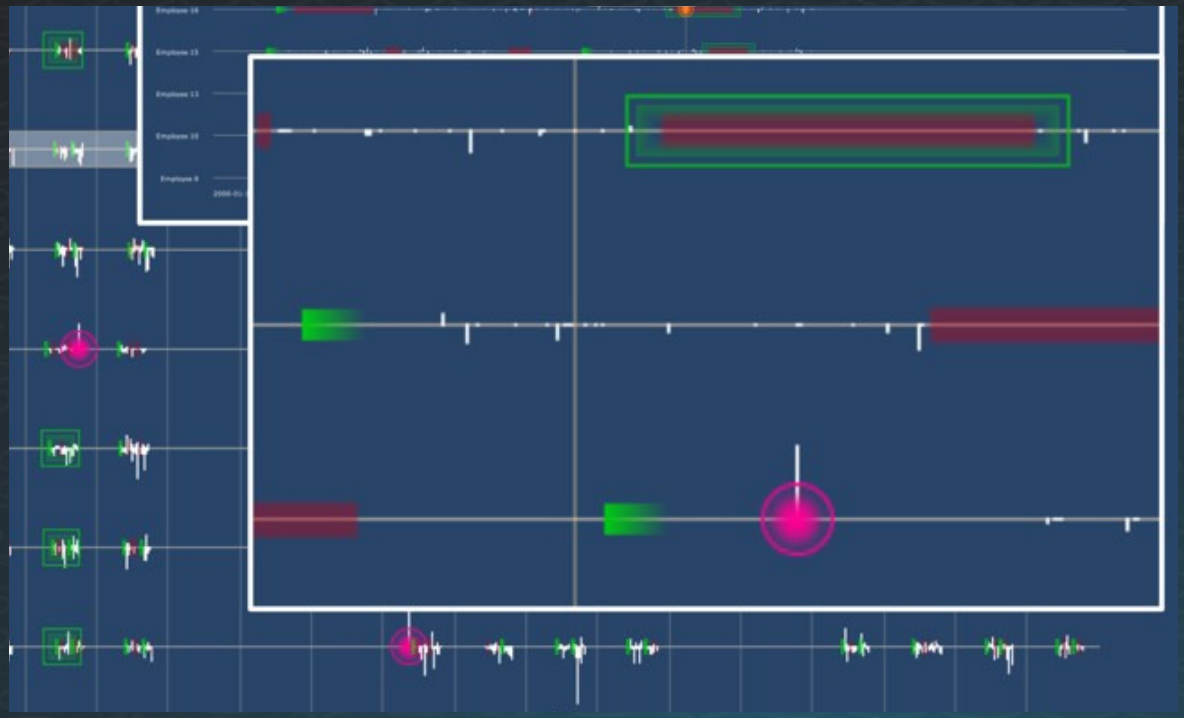
System/Tool Award

SONIVIS, University of Stuttgart

Good Tool Flexibility

Created a monitoring instrument integrated with Sonivis visualization tool



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Challenge 2
Flitter Social Network

Flitter Social Network

- Dataset
  - Nicknames and links between them
  - A map of Flovania
- Analytic Situation

Flitter Social Network

- Dataset
  - Nicknames and links between them
  - A map of Flovania
- Analytic Situat

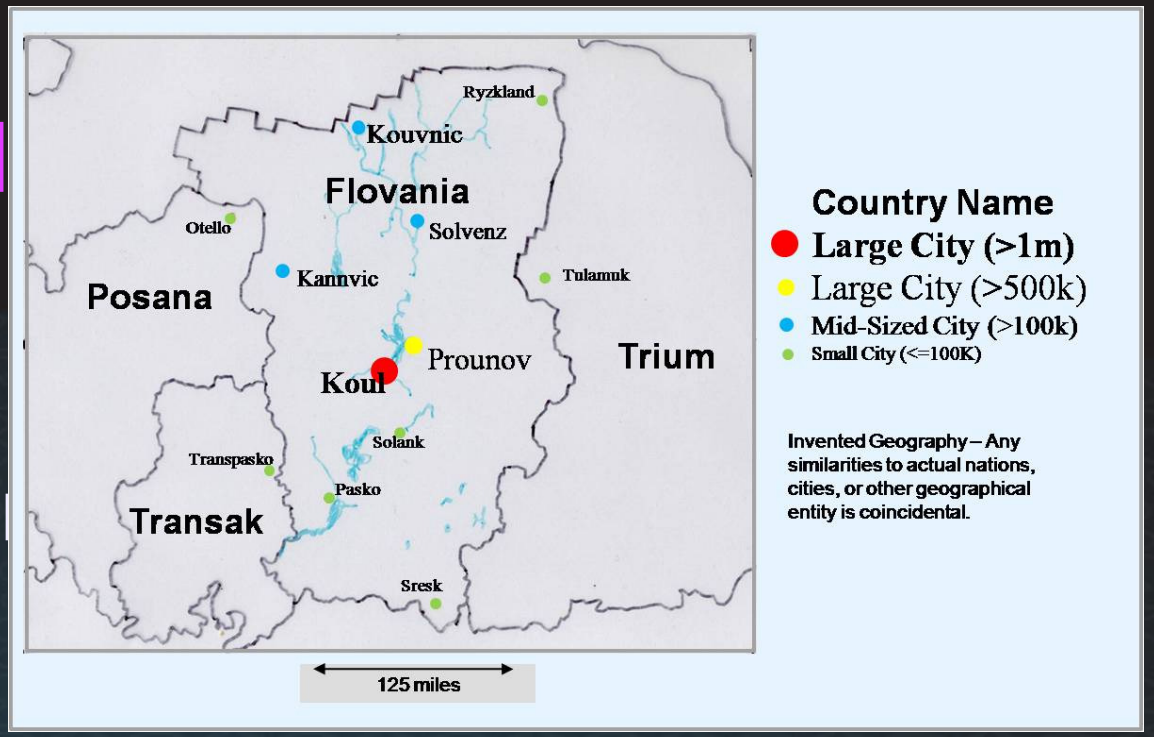
	A	B
1	1	@irvin
2	2	@rachel
3	3	@dykema
4	4	@szemeredi
5	5	@jantke
6	6	@tadokoro
7	7	@tweedie
8	8	@morillo
9	9	@burgard
10	10	@odberg
11	11	@cornell
12	12	@baca
13	13	@coron
14	14	@afsarmanesl
15	15	@regin
16	16	@bates
17	17	@inenaga
18	18	@jouvelot
19	19	@marrevee

	A	B
1	ID1	ID2
2	INT	INT
3	1	2
4	3	1
5	3	2
6	4	2
7	4	1
8	4	3
9	5	1
10	5	2
11	5	3
12	5	4
13	6	1
14	6	2
15	6	3
16	6	5
17	7	5
18	7	1
19	7	3

	A	B
1	ID	City
2	INT	STRING
3	1	Koul
4	2	Kouvnic
5	3	Koul
6	4	Kouvnic
7	5	Kannvic
8	6	Koul
9	7	Koul
10	8	Kouvnic
11	9	Prounov
12	10	Prounov
13	11	Ryzkland
14	12	Koul
15	13	Pasko
16	14	Kouvnic
17	15	Kouvnic

Flitter Social N

- Dataset
  - Nicknames and lin
  - A map of Flovania
- Analytic Situat



	A	B
1	1	@irvin
2	2	@rachel
3	3	@dykema
4	4	@szemeredi
5	5	@jantke
6	6	@tadokoro
7	7	@tweedie
8	8	@morillo
9	9	@burgard
10	10	@odberg
11	11	@cornell
12	12	@baca
13	13	@coron
14	14	@afsarmanesl
15	15	@regin
16	16	@bates
17	17	@inenaga
18	18	@jouvelot
19	19	@marrevee

	A	B
1	ID1	ID2
2	INT	INT
3	1	2
4	3	1
5	3	2
6	4	2
7	4	1
8	4	3
9	5	1
10	5	2
11	5	3
12	5	4
13	6	1
14	6	2
15	6	3
16	6	5
17	7	5
18	7	1
19	7	3

	A	B
1	ID	City
2	INT	STRING
3	1	Koul
4	2	Kouvnic
5	3	Koul
6	4	Kouvnic
7	5	Kannvic
8	6	Koul
9	7	Koul
10	8	Kouvnic
11	9	Prounov
12	10	Prounov
13	11	Ryzkland
14	12	Koul
15	13	Pasko
16	14	Kouvnic
17	15	Kouvnic

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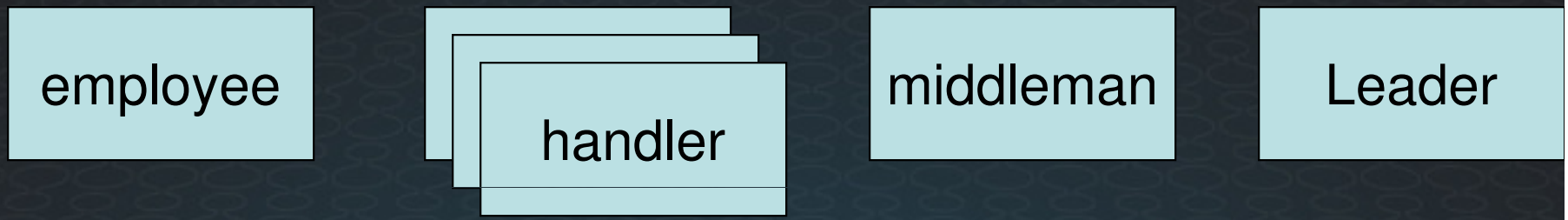
Flitter Social Network

- Dataset
  - Nicknames and links between them
  - A map of Flovania
- Analytic Situation

Flitter Social Network

- Dataset
  - Nicknames and links between them
  - A map of Flovania
- Analytic Situation
  - Network may reveal a criminal ring that may have recruited the embassy employee
  - Past analysis provides hypotheses about likely social structure (A or B?)

Network A



~40 contacts

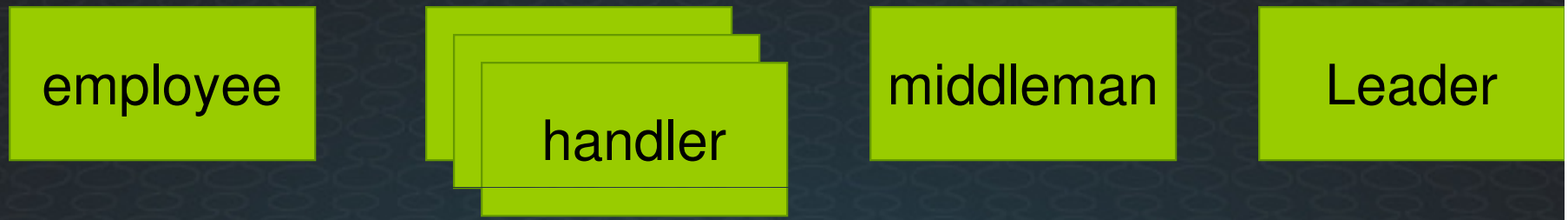
30-40 contacts

1 or 2 contacts

Many international contacts

nicknames unknown

Network A or B?



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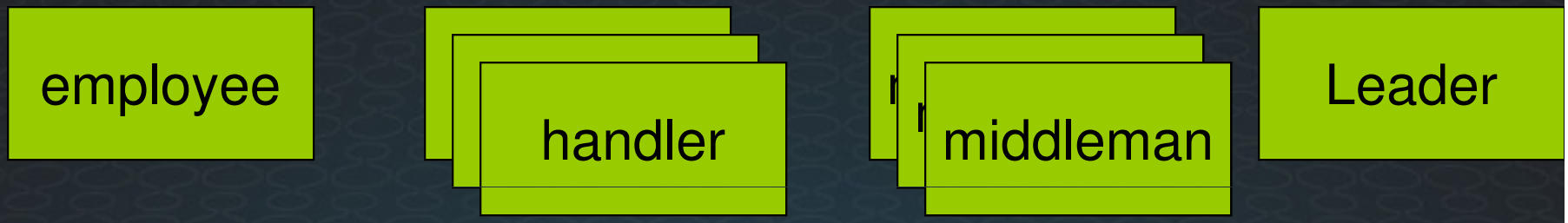
Network A or B?

In B: 3 middlemen



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Network A or B?

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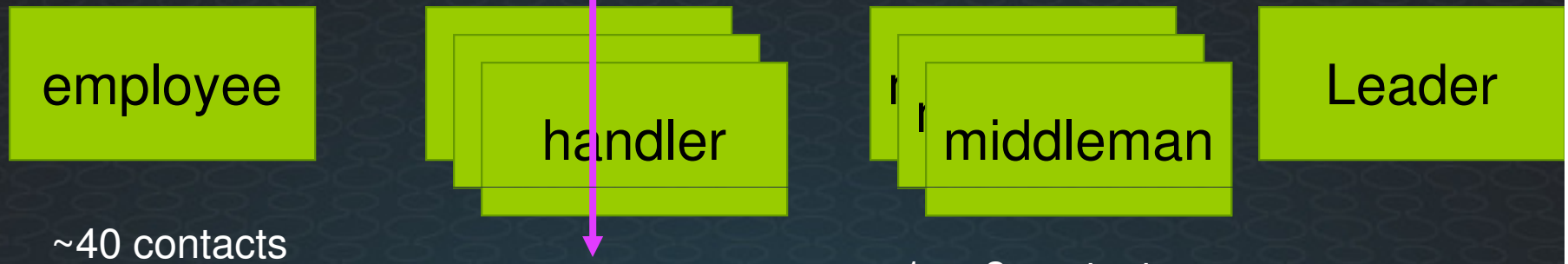


~40 contacts

30-40 contacts

1 or 2 contacts

Many international contacts

In B: NO communication between handlers

nicknames unknown

Network A or B?

In B: 3 middlemen

employee

handler

middleman

Leader

~40 contacts

30-40 contacts

1 or 2 contacts

Many international contacts

In B: NO communication between handlers

nicknames unknown

Network A or B?

In B: 3 middlemen

employee

handler

middleman

Leader

~40 contacts

30-40 contacts

1 or 2 contacts

Many international contacts

In B: NO communication between handlers

large city

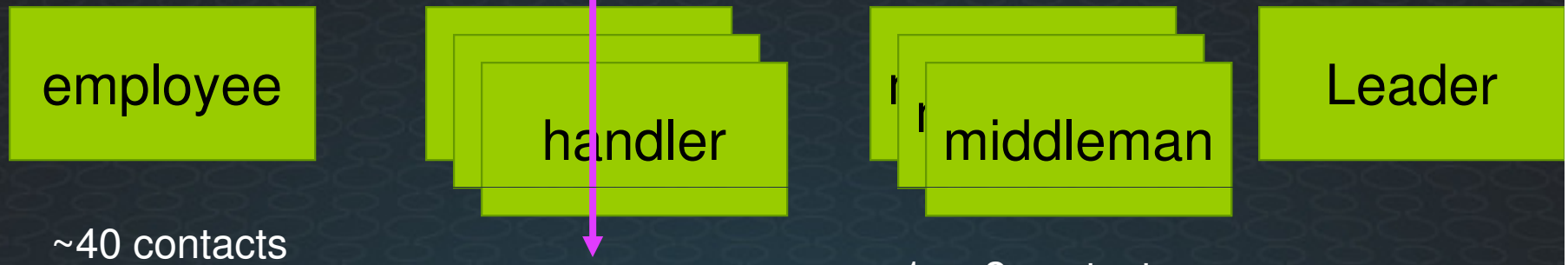
Nearby smaller city

nicknames unknown

large city

Network A or B?

In B: 3 middlemen



~40 contacts

30-40 contacts

1 or 2 contacts

Many international contacts

In B: NO communication between handlers

large city

Nearby smaller city

nicknames unknown

large city

hypotheses

Questions

- A or B?
- Characterize the difference between your social network and the closest social structure you selected (A or B)

In general

- Most found answer – or close
- Mostly node link diagrams
- Diversity in setting of constraints

Differences in Setting of Constraints

- Constraints on attribute of nodes
  - Degree (range of # of contacts)
  - Location (in Flovania, or international)
- Linear path constraints o—o—o—o
- Graph constraints
  - Linear + multiple edges (e.g. 3 handlers)
  - Arbitrary graph
- No one set constraints for “Absence of” (e.g. no connection between handlers)

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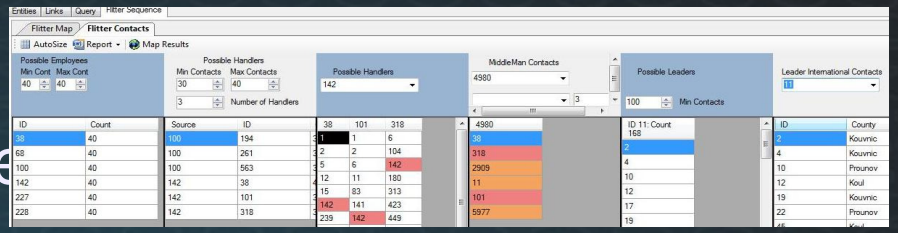

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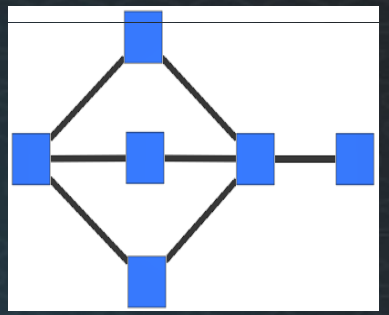

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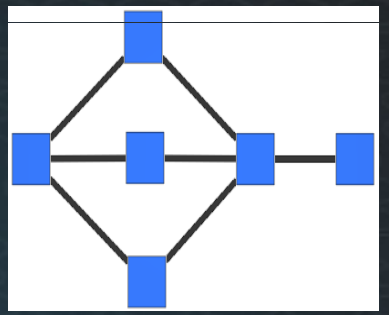


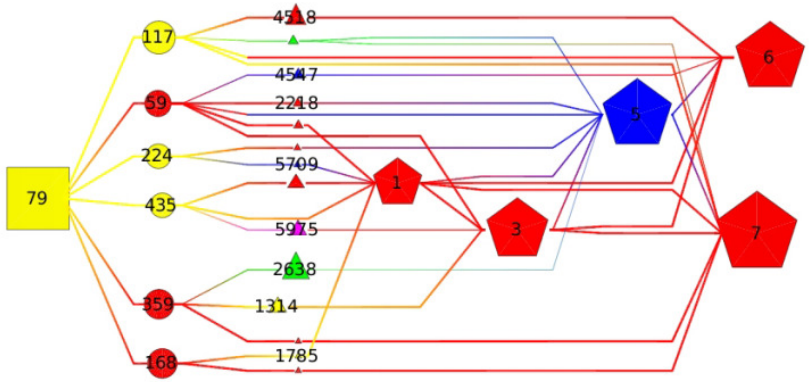
Differences in Setting of Constraints

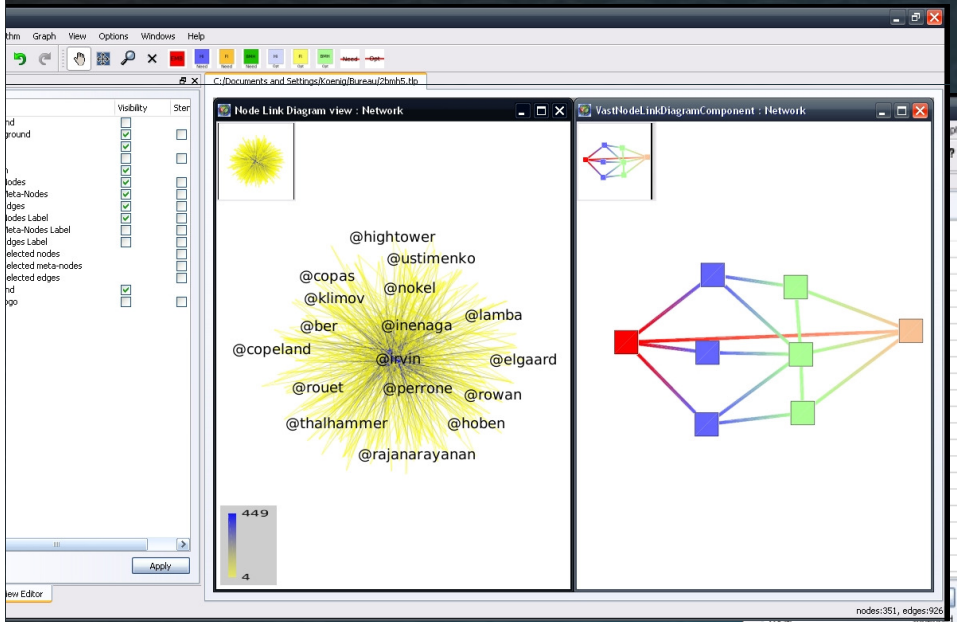
- Hard coded rules, or
- Methods to specify constraints
  - command language queries
  - generic rules “easily” programmed
    then graphical editor to apply them to data
  - graphical editors to define constraint
- Some were entirely specified
  Most partially specified plus visual inspection

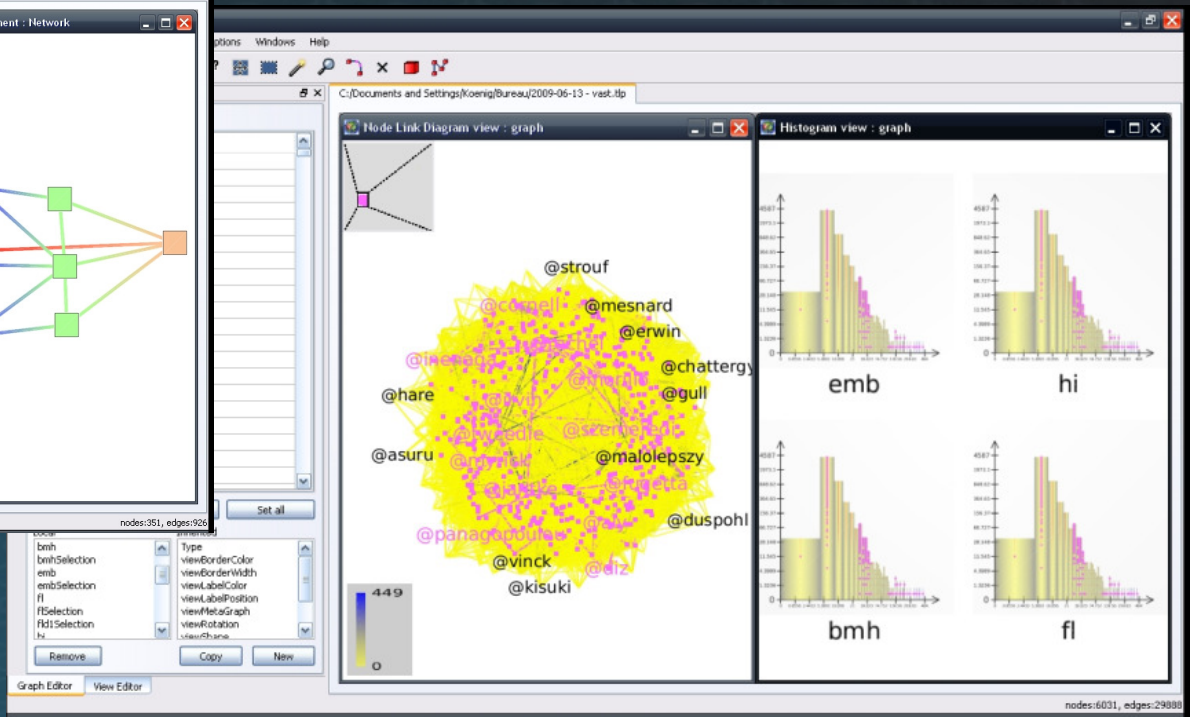
Social Network Awards

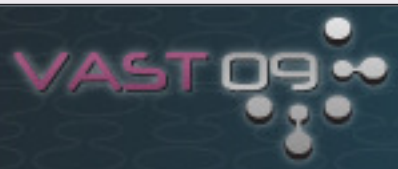
Visualization Award

- LaBRI, INRIA Bordeaux
  (student team)
- Representation of Uncertainty in Rules & Visualization





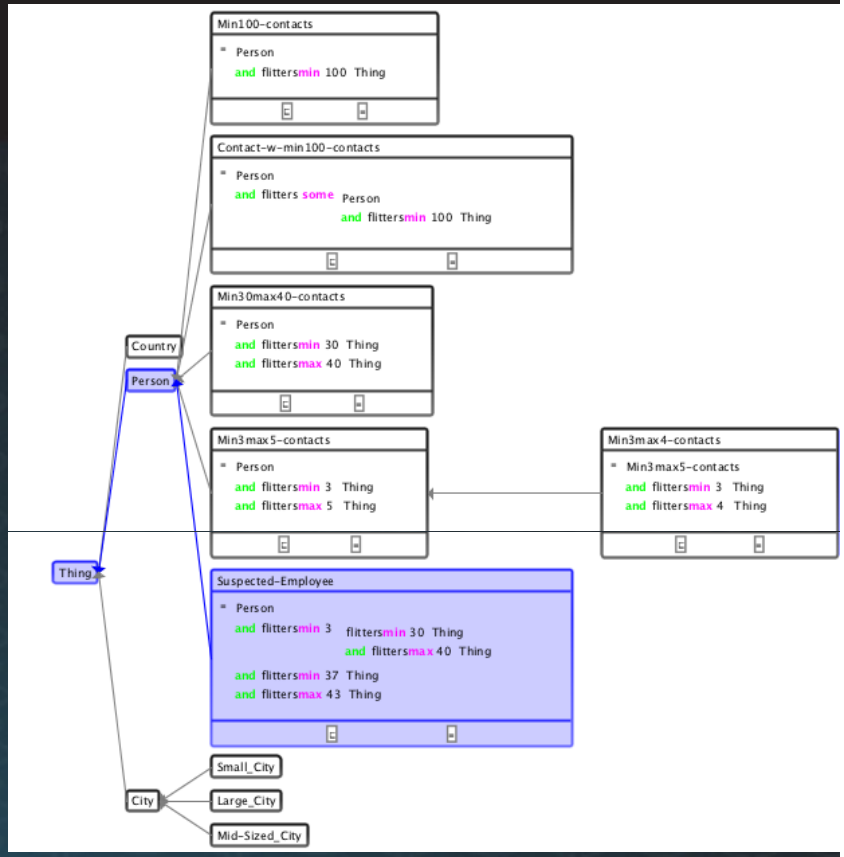




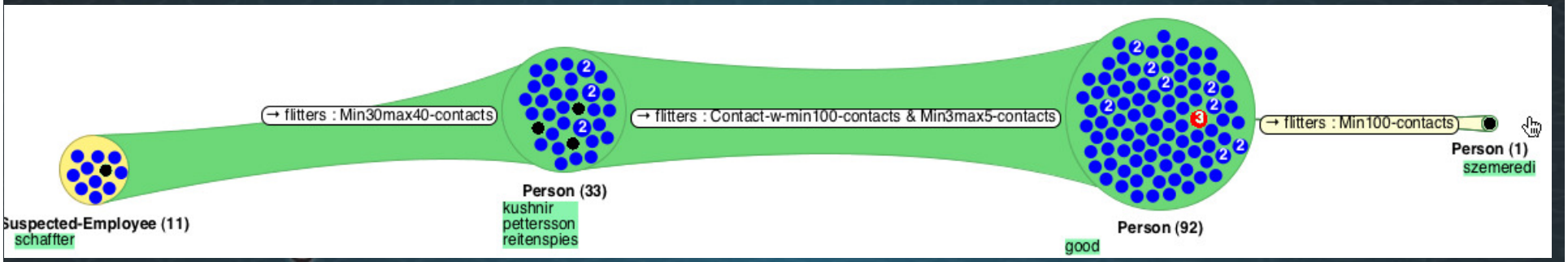
Visualization Award

- Ulm University & Derivo

  Novel Visualizations of Effect of Rule Application



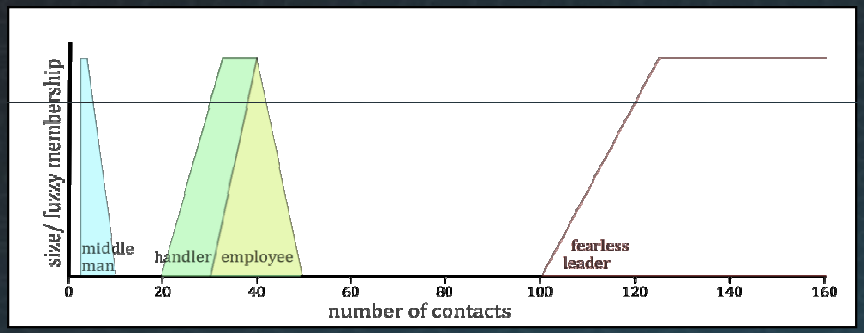
Graphical Constraint Ontology

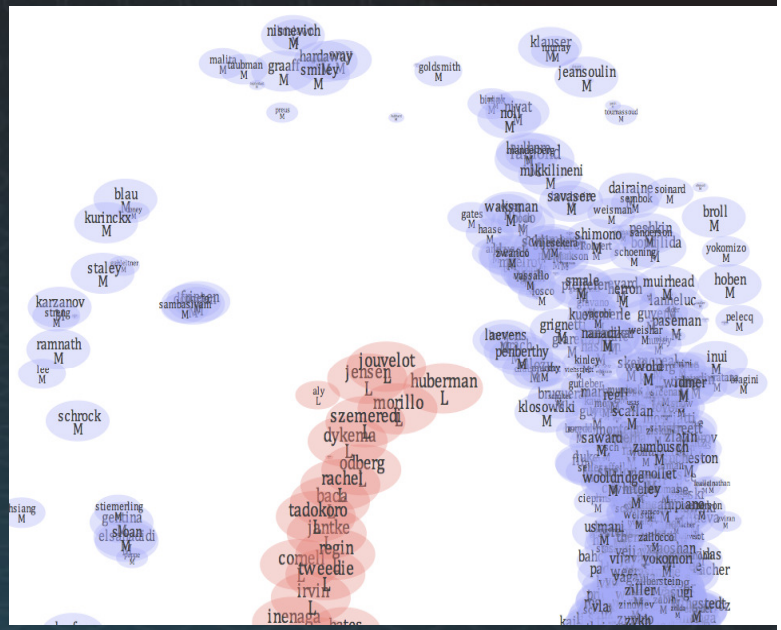


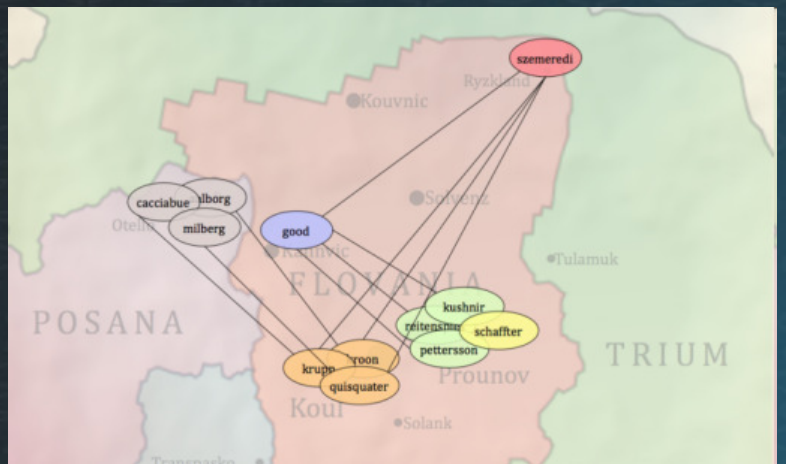
Visualization / Analysis Award

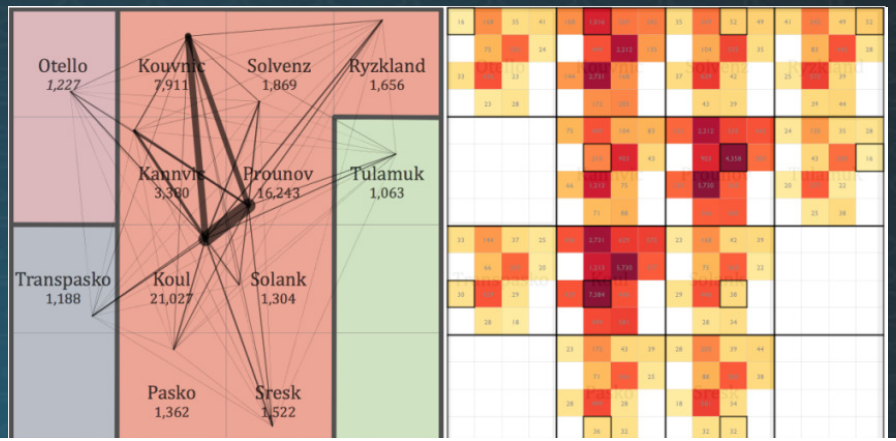
- GiCenter, City University London

  Good Visualization of Uncertainty and analysis of Geographical Data



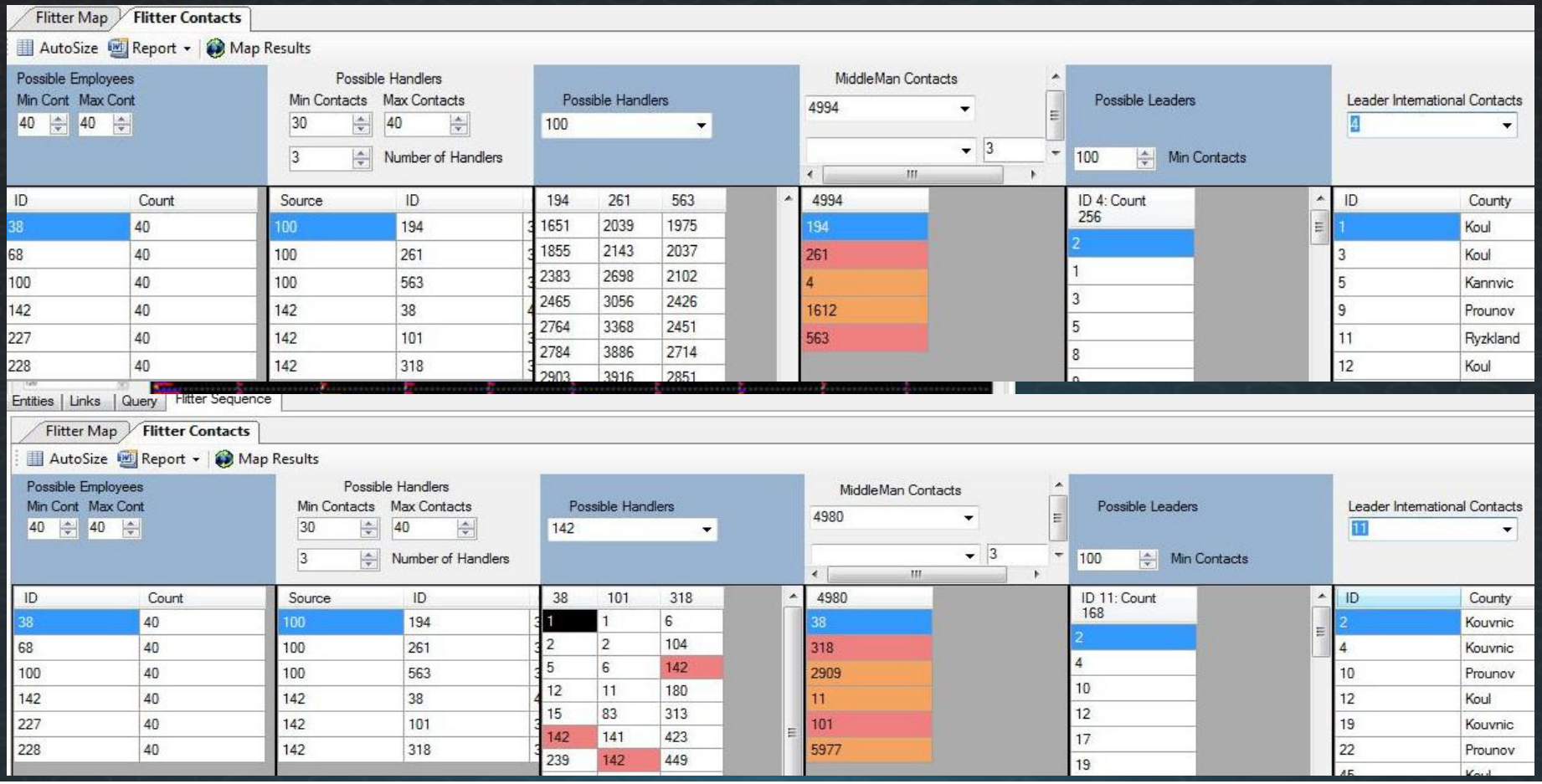






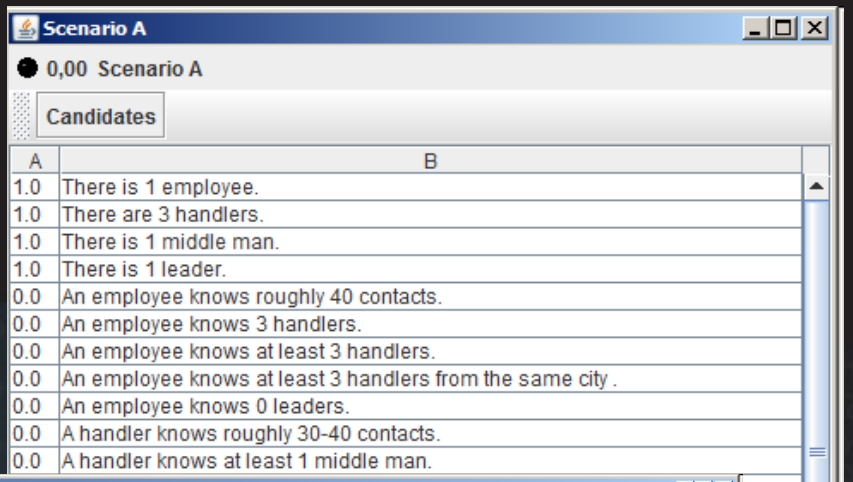
Analytic Process Award

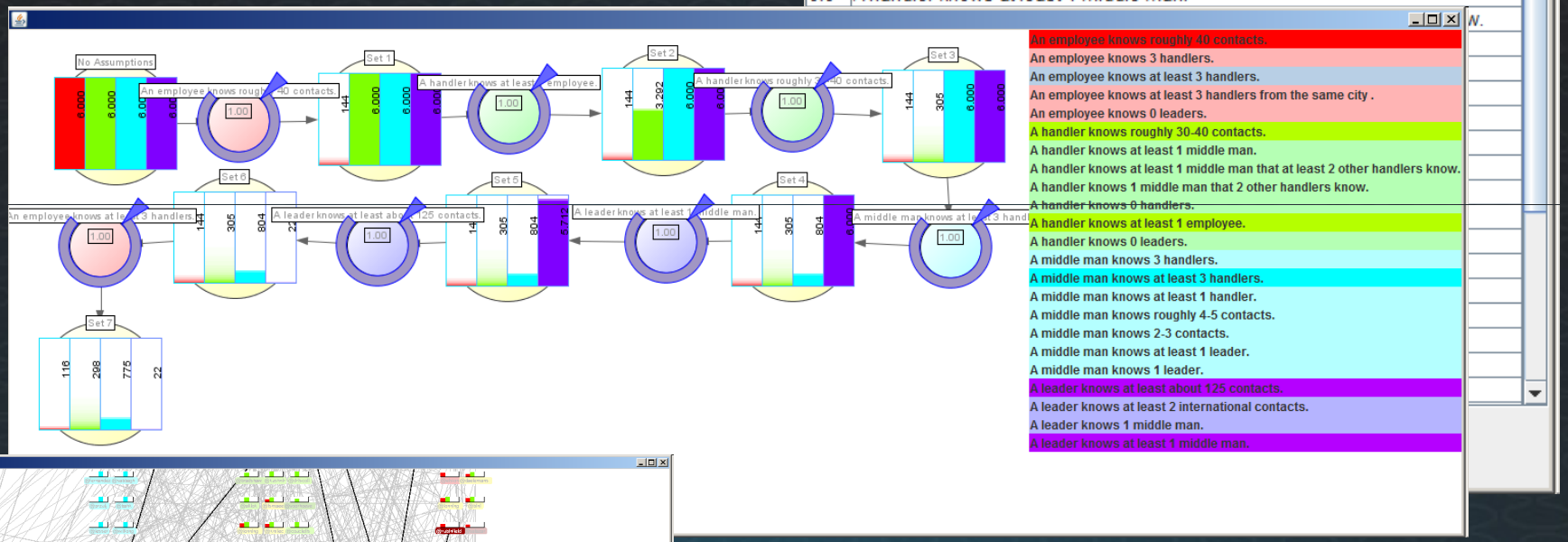
- Lorne Leonard (Pennsylvania State University)
  Good Use of Competing Hypotheses

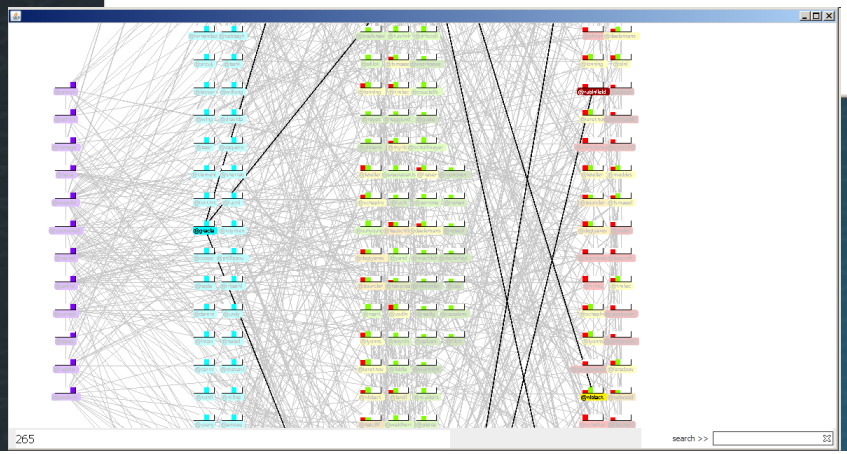


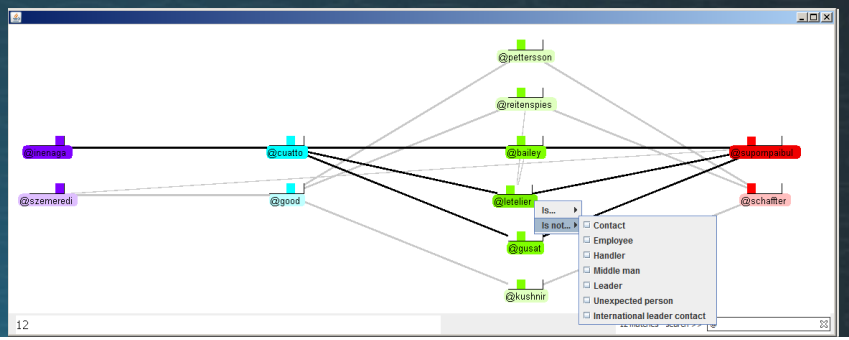
System/Tool Award

- Universität Stuttgart
  Innovative Analytic Tool



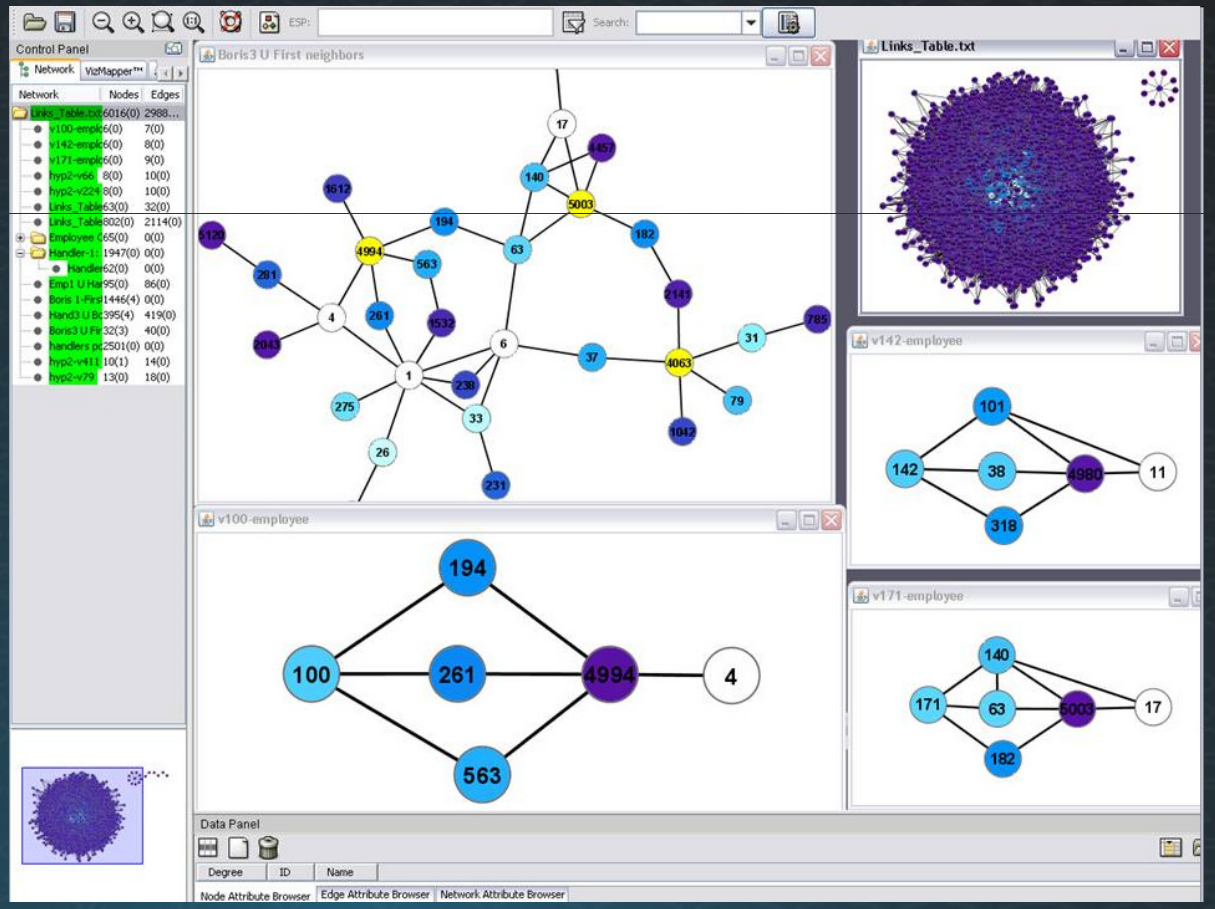






System/Tool Award

- University of Michigan (student team)
  Good Tool Adaptation



Adaptation of
Cytoscape

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Analysis Award

- MTA SZTAKI Institute
  Good Analytical Debrief

- University of Konstanz (student team)
  Good Analytical Debrief

Challenge 3
Video Analysis

Video Data

- Dataset: Quicktime video taken from a city webcam
- Analytic Situation: We suspect that at least one, perhaps more, meetings of persons associated with this case took place at locations captured by this camera
- The Catch: The webcam moved between four locations every few seconds. Also the web traffic often lagged, so that each scene transition isn't as smooth as one would like…


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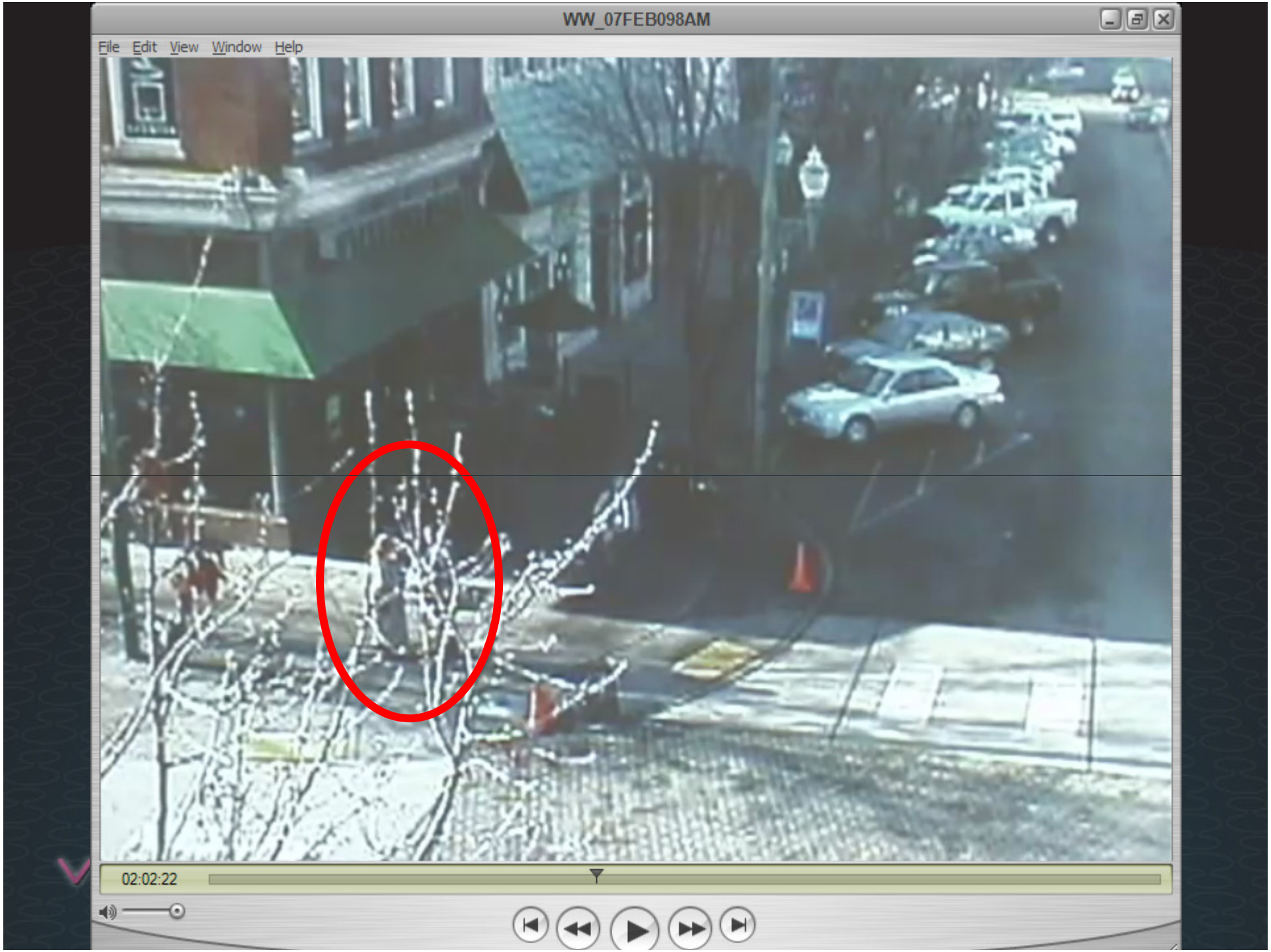
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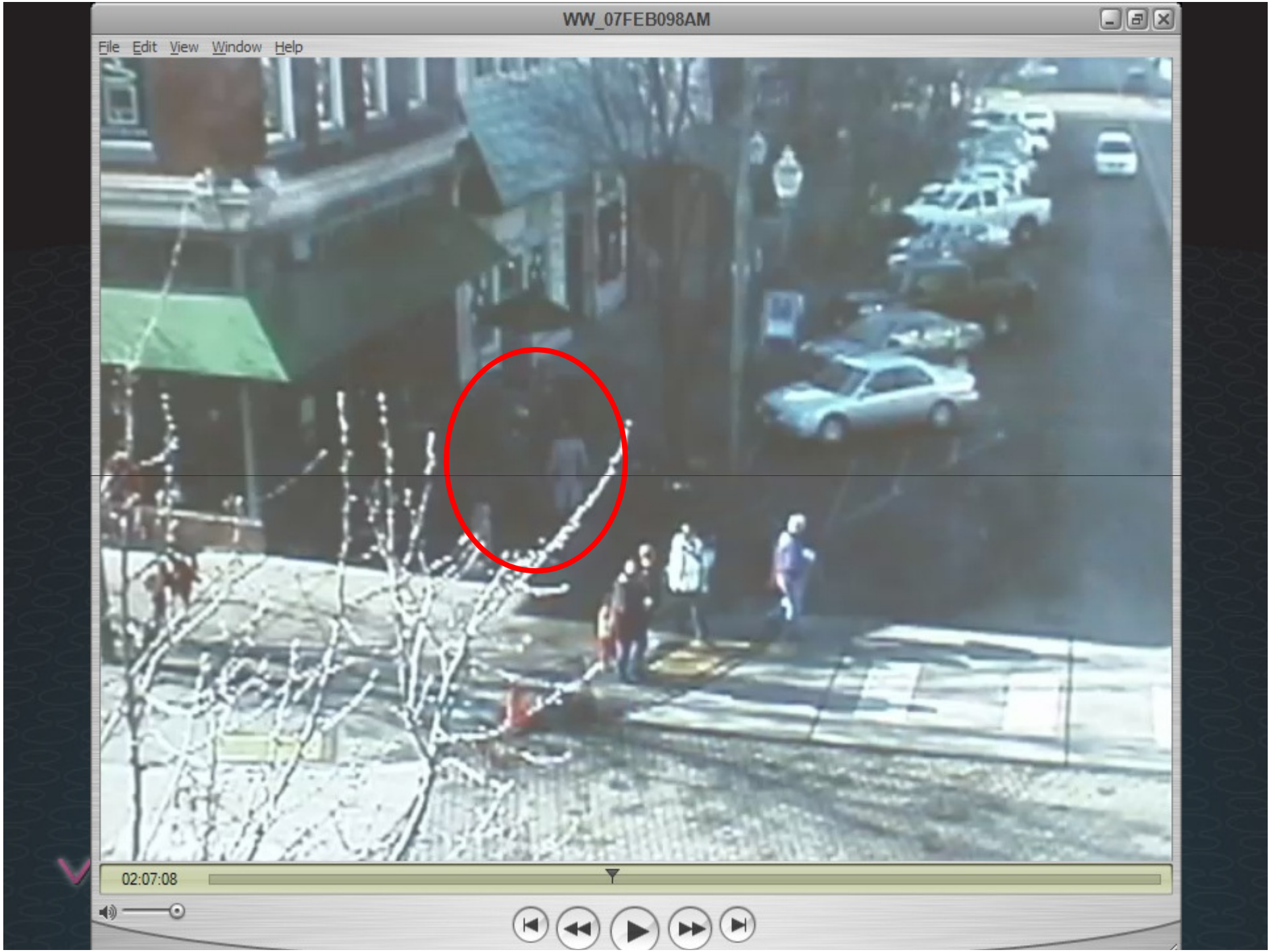
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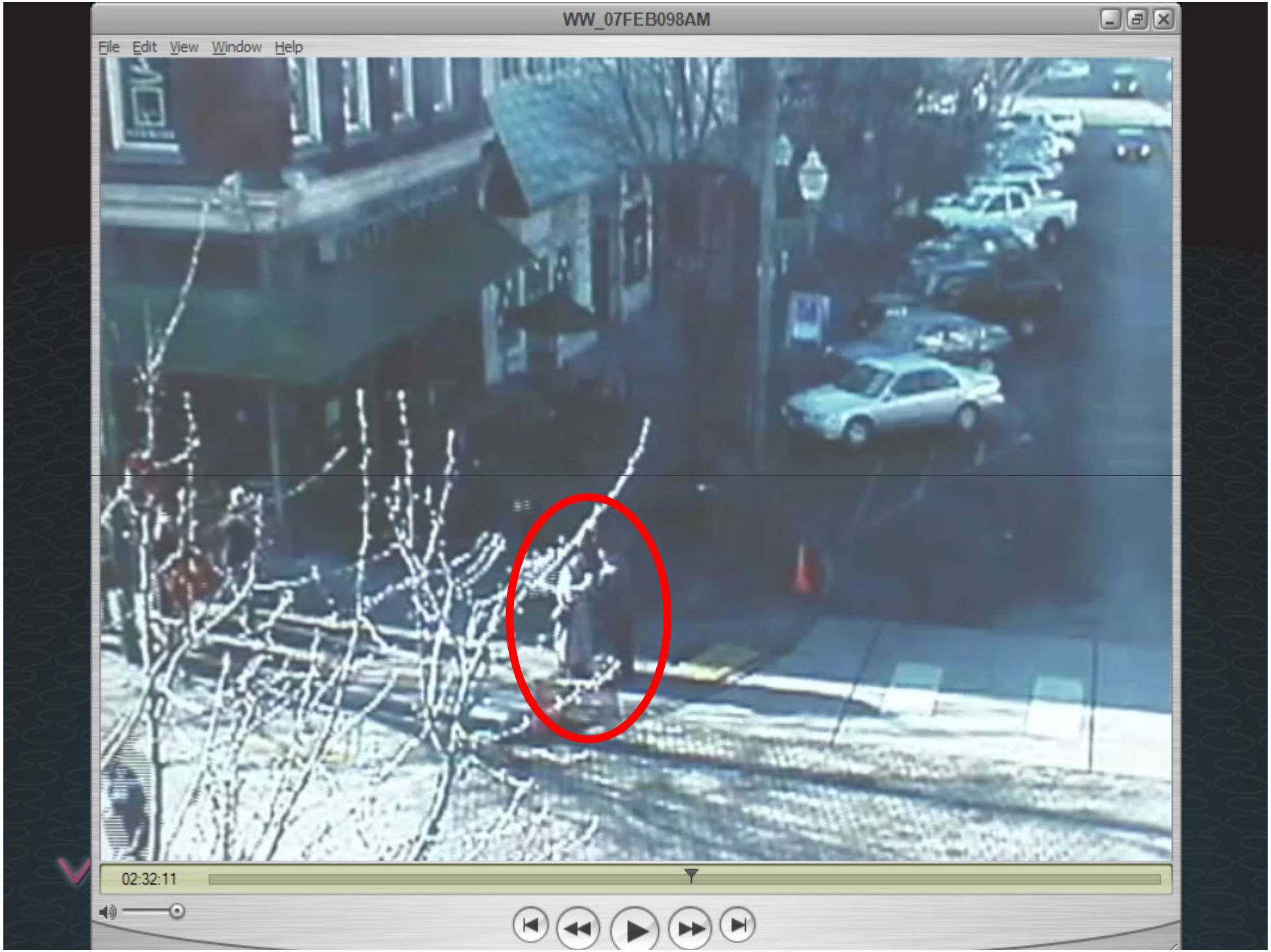
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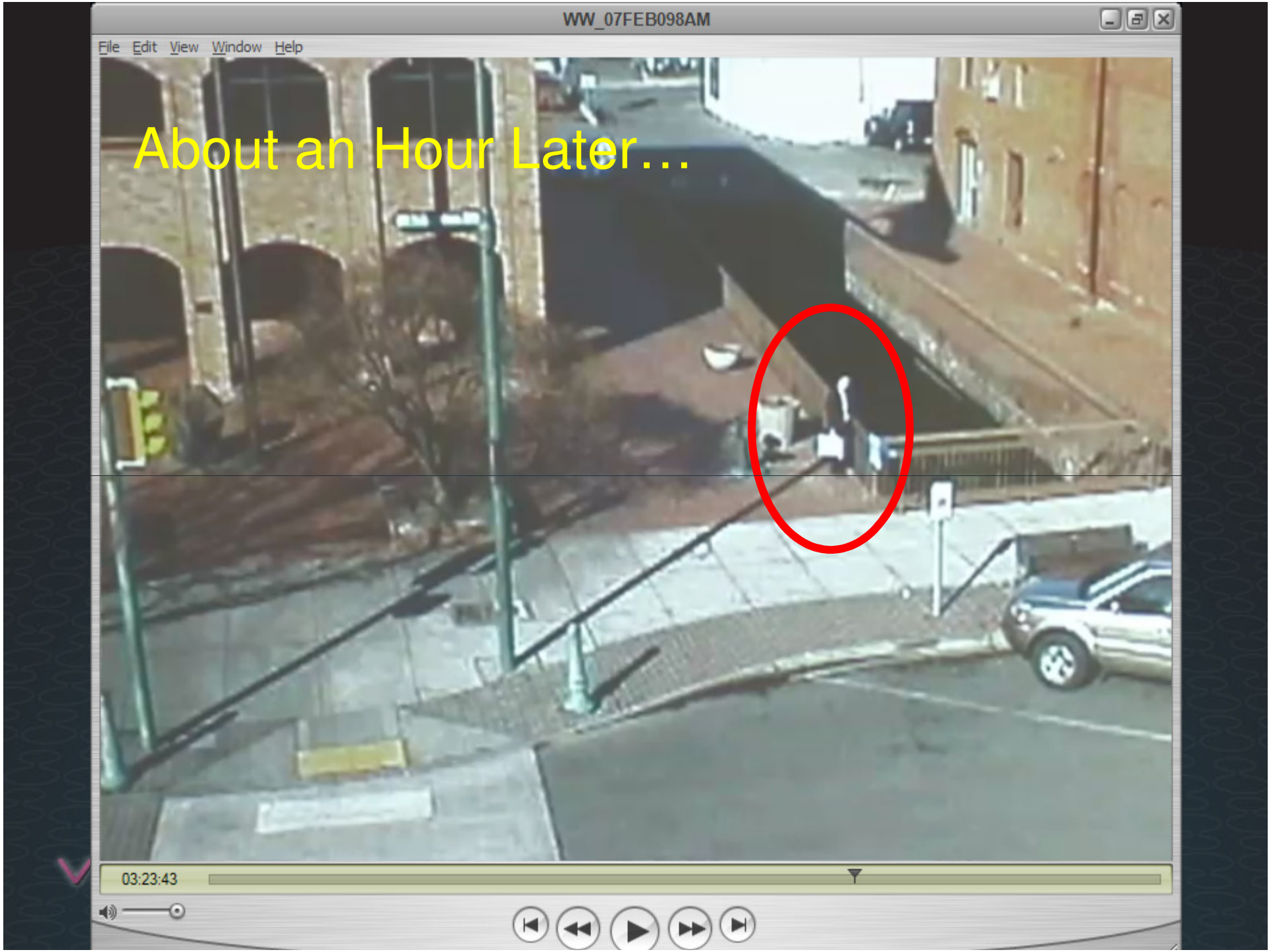
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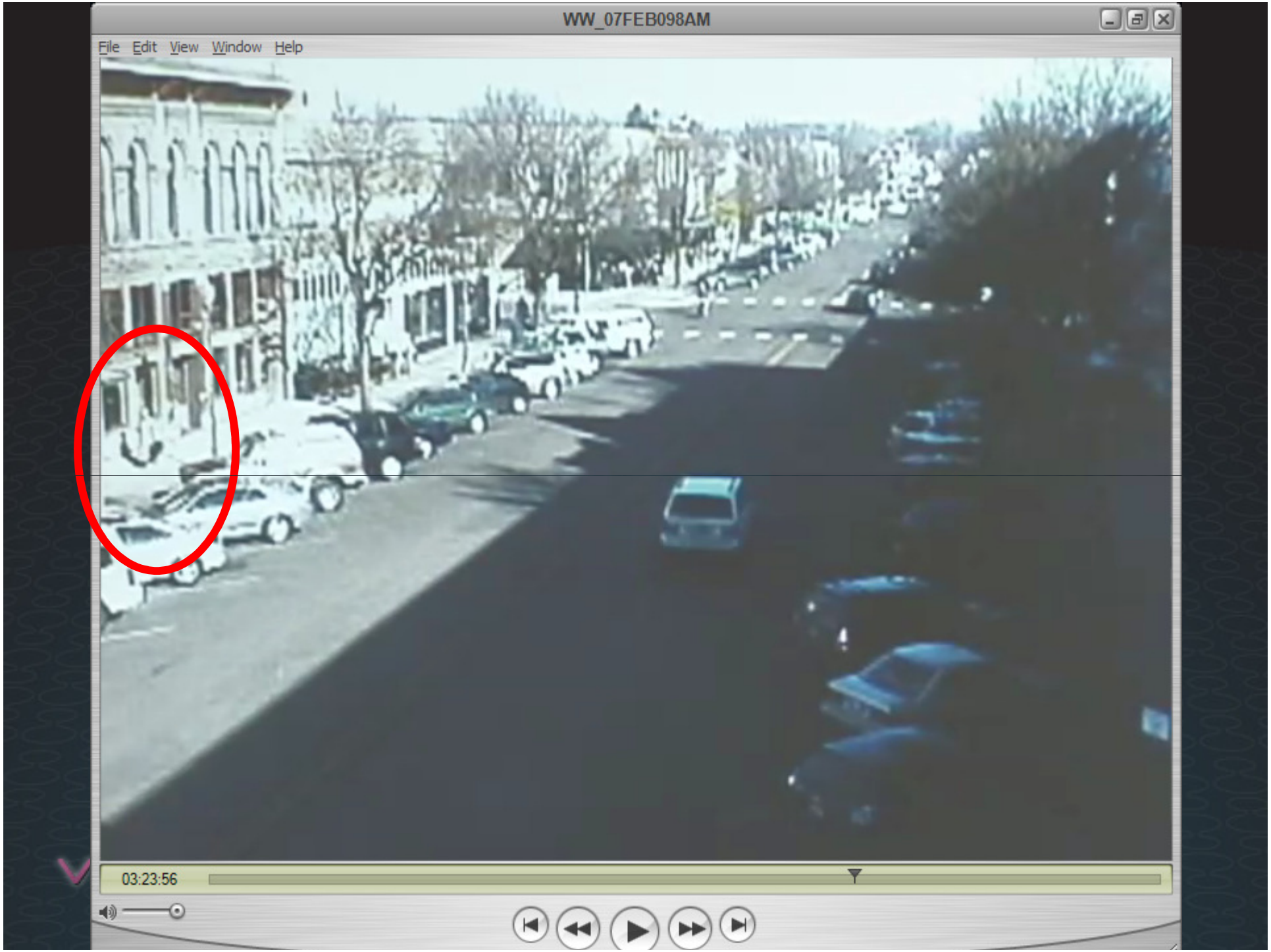
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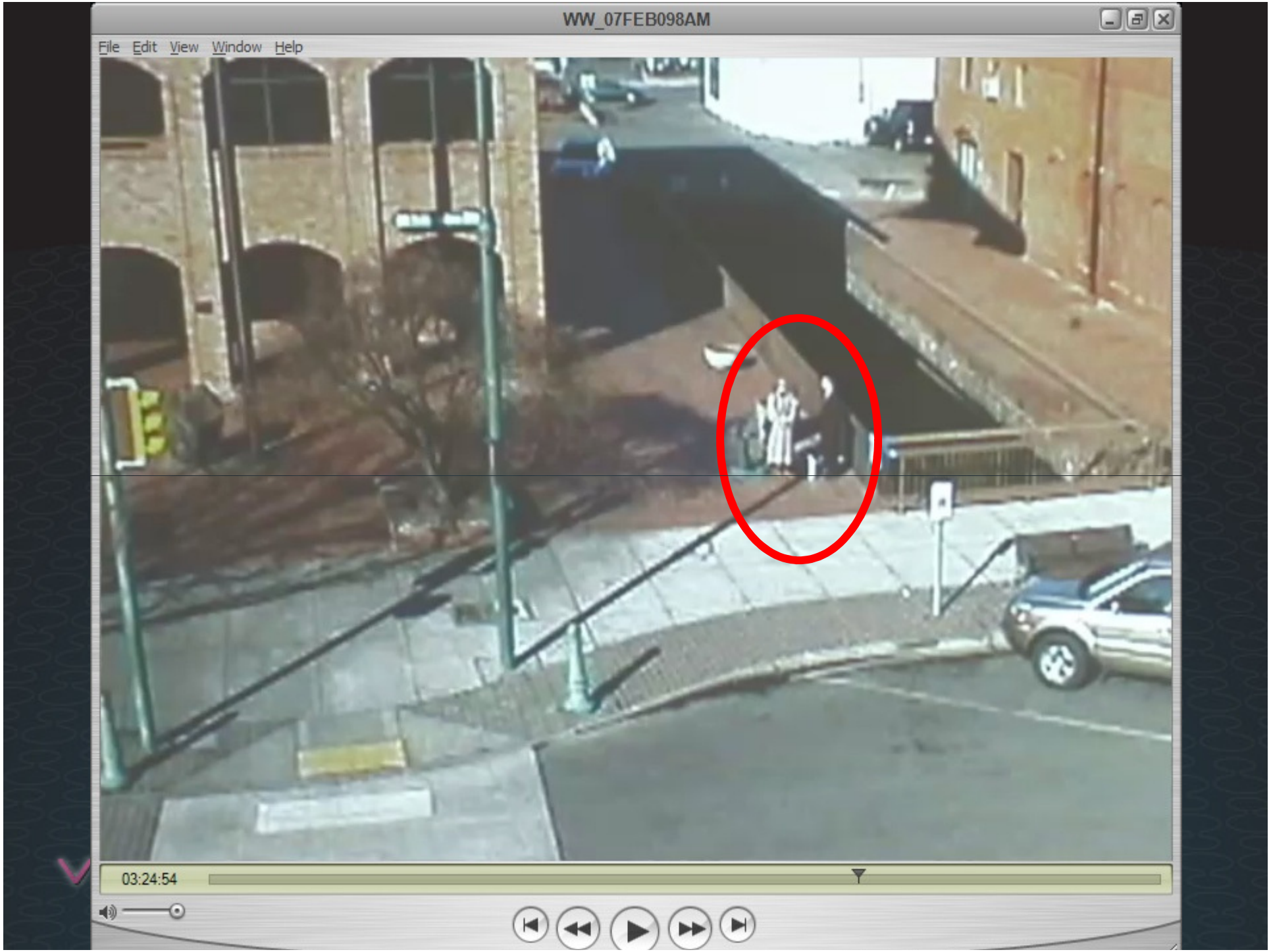
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Video Mini-Challenge Questions

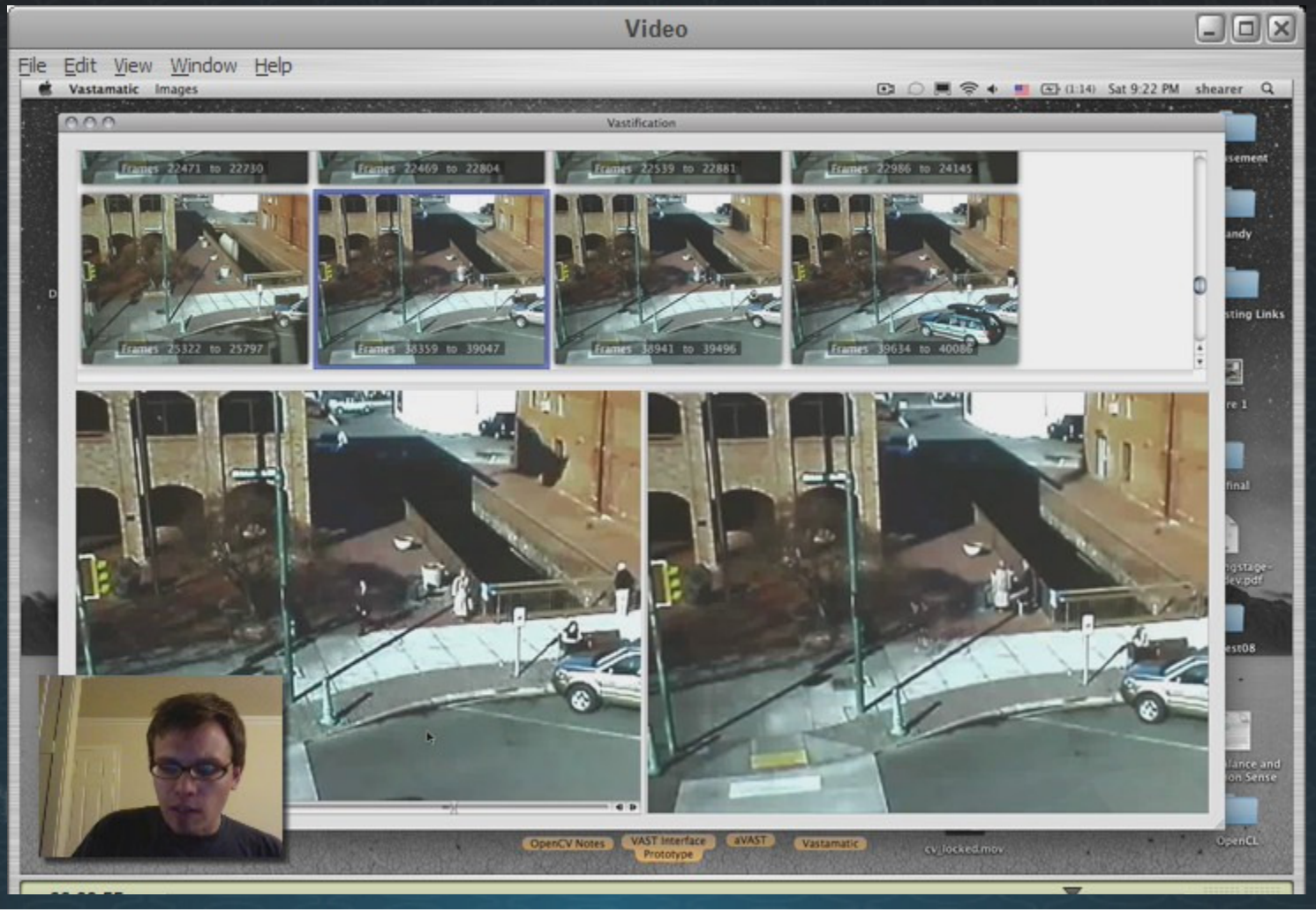
- Identify any events of potential counterintelligence or espionage interest in the video.
- Provide details, including a description of any activities, and why the event is of interest.
- Provide information to include the location, start time, and duration of the events.

Video Analysis Awards

System/Tool Award

University of California Davis (student team)

Integration of Open Source Tools for Video Analysis



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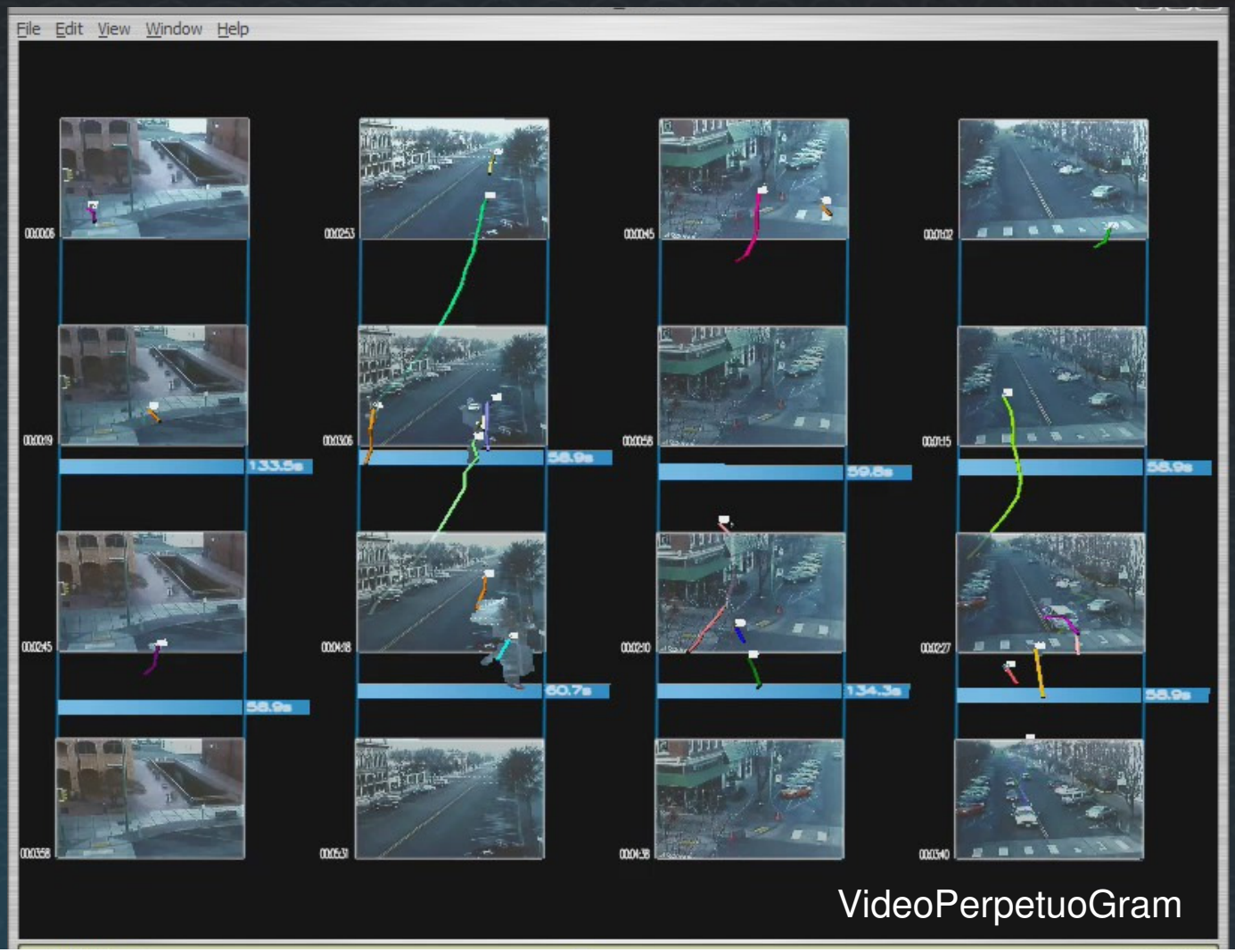
System/Tool Award

Universität Stuttgart

Outstanding Video Analysis Tool



Grand Challenge Awards

Grand Challenge

- Datasets
  - We provided several additional pieces of information to assist in summarizing the activities of the employee and the criminal organization
  - We provided a list of IP address of machine in the embassy mapped to staff IDs
  - We provided a list of Prox card IDs mapped to staff IDs
- Analytic Situation
  - Provide your best overall assessment of the scenario based on your evidence collection

Grand Challenge Questions

- Describe the scenario supported by your analysis of the three mini-challenges
- Who are the major players in the scenario and what are their relationships?

Outstanding Integration of Mini-Challenge Results into Debrief

- University of Konstanz (student team)

Excellent Example of Analytic Tradecraft

- Universität Stuttgart

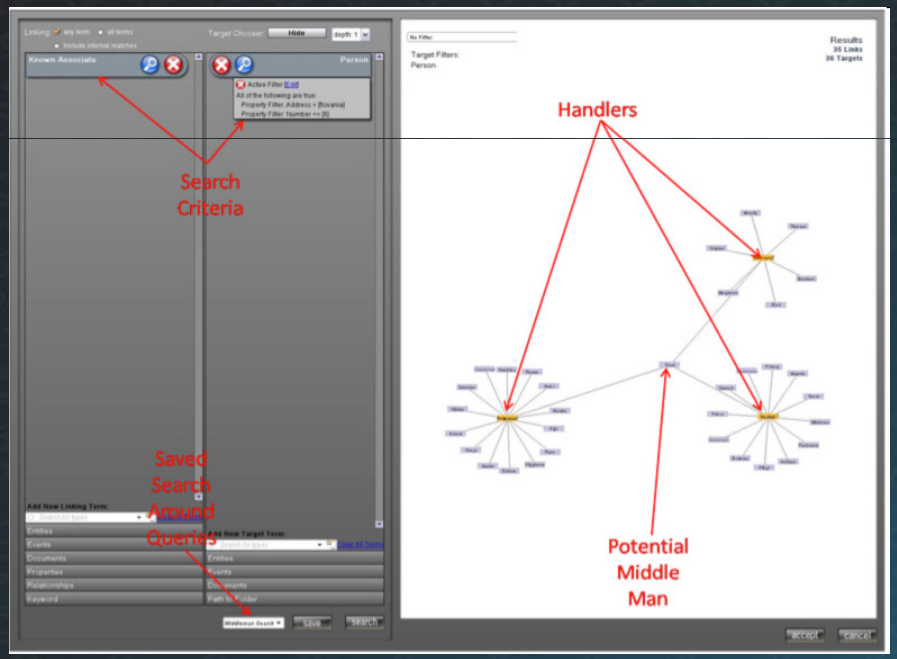
Criminal Organization Structure

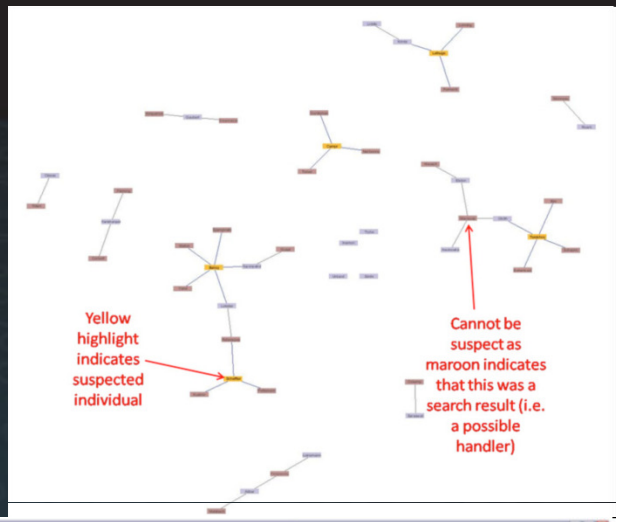
Scenario A can be matched very precisely on the flitter network. The flitter user @schaffter that matches the role of an employee and the three users @pettersson, @reitenspies, and @kushnir matching the role of handlers are located in Prounov. The user @good matching the role of a middleman is located in Kannvic and the user @szemeredi matching the role of the leader is located in Kouvnic.

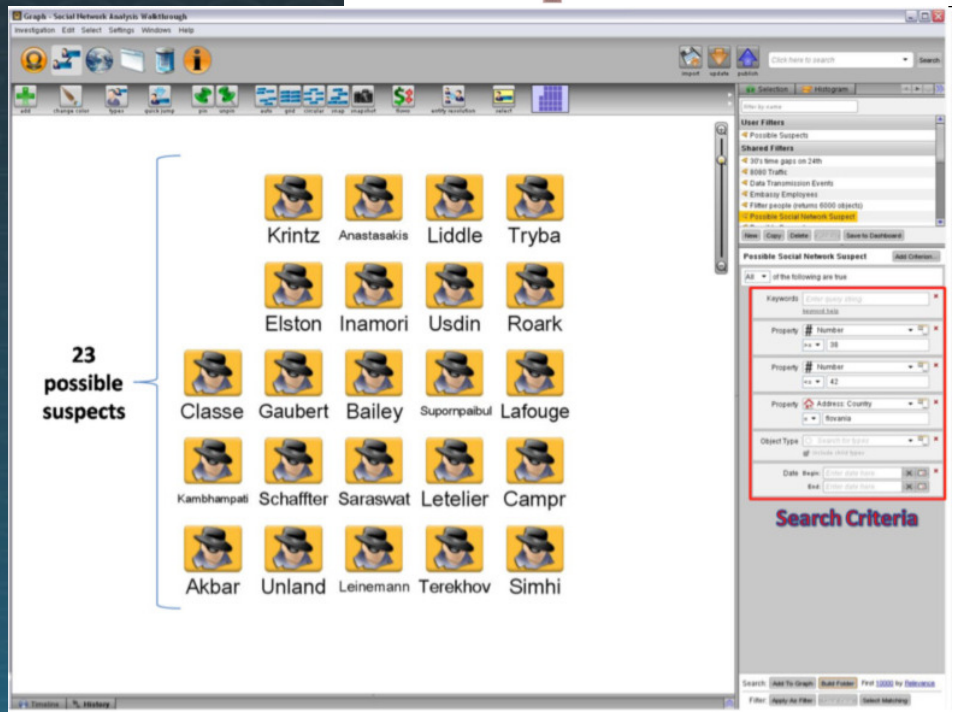
From this information we infer that the embassy is

Analyst's Tool Choice

- Palantir Technologies







VAST 09

The Participant Workshop

Saturday full day


Opportunity for YOU to
- Provide FEEDBACK and suggestions
- LEARN from other teams (try the demos!)
- Learn from analysts
Discuss the future
PANEL: we summarize for Vizweek attendees

VAST 09

Audience Questions

Want to see the Submissions?
Solutions?

Visual Analytics Benchmark Repository

- 2006-2009 VAST datasets (and others)
- All solutions and USES (e.g. the submissions)
- you can CONTRIBUTE:
  - new USEs
  - references to papers if used benchmark

Visual Analytics Benchmark Repository

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Managed by HCIL, University of Maryland

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About Us

The repository:

The Visual Analytics Benchmarks Repository contains resources to **improve the evaluation of visual analytics technology**. Benchmarks contains **datasets and tasks**, as well as materials describing the **uses** of those benchmarks (the results of analysis, contest entries, controlled experiment materials etc.) Most benchmarks contain ground truth described in a **solution** provided with the benchmark, allowing accuracy metrics to be computed. When the use of the benchmark is described in a paper, the **paper** can be linked to the benchmark(s) used.

How you can contribute:

You can contribute new benchmarks (either by uploading them or by pointing to them), references to papers that use a benchmark, or detailed results from your own use of the benchmark. Please use the **login** page to request a name and password. We will work with you to develop new benchmarks and appropriate materials for submission.

History:

This repository replaces and extends the Information Visualization Benchmarks Repository started in 2003, with datasets from the InfoVis Contest. Starting in 2006 the VAST Contests and later the VAST Challenges which took place at the IEEE VAST symposium provided the 1st set of Benchmark with ground truth and solutions. Full credit and provenance information is given separately for each benchmark.

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Developed by Swetha Reddy, under the supervision of Catherine Plaisant

Support for the development of the Repository has been provided by the National Science Foundation under a Collaborative Research Grant to the following three institutions:

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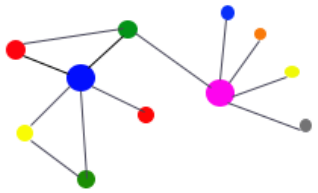

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IS-0713087 Plaisant, Catherine, University of Maryland, College Park

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University of North Carolina, Charlotte	Analysis of Financial Transactions
Purdue University	Synthetic Syndromic Surveillance Data Creation Toolkit
VAST Challenge 2008	Grand Challenge 2008 Cell Phone Calls Migrant Boats Evacuation Traces Wiki Editors
InfoVis 2008 Contest	Raw Motion Data
VAST 2007 Contest	Grand Challenge 2007
InfoVis 2007 Contest	InfoVis Goes to the Movies
Virginia Tech	Bioinformatics - this is a draft

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Benchmark Details

Title: **Video Analysis** Provenance: VAST Challenge 2009

Description : Identify any events of potential counterintelligence/espionage interest in the video. more

Dataset available at : http://hcil.cs.umd.edu/localphp/hcil/vast/index.php/register
Ground truth present : yes
Solution present : yes , Link to solution
Creation date : 2009
Datatype : video

Contact Information : Georges Grinstein, University of Massachusetts Lowell
Catherine Plaisant, HCIL, University of Maryland
Jean Scholtz, Pacific Northwest National Laboratory
Mark Whiting, Pacific Northwest National Laboratory

Edit Benchmark

Benchmark Uses

Add Benchmark use | Edit Benchmark use

Total number of uses: 5

Used by:	Description
LaBRI, INRIA Bordeaux Sud-Ouest	
Leonard - EAKOS 2009	
VIDI Surveillance	**Award:** Good integration of open source tools for video analysis
US-Spray3D,Universität Stuttgart	**Award:** outstanding video analysis tool
University of Konstanz	

Done

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Description : Identify any events of potential counterintelligence/espionage interest in the video. more

Dataset available at : http://hcil.cs.umd.edu/localphp/hcil/vast/index.php/register
Ground truth present : yes
Solution present : yes , Link to solution
Creation date : 2009
Datatype : video

Contact Information : Georges Grinstein, University of Massachusetts Lowell
Catherine Plaisant, HCIL, University of Maryland
Jean Scholtz, Pacific Northwest National Laboratory
Mark Whiting, Pacific Northwest National Laboratory

Edit Benchmark

Benchmark Uses

Add Benchmark use | Edit Benchmark use

Total number of uses: 5

Used by:	Description
LaBRI, INRIA Bordeaux Sud-Ouest	
Leonard - EAKOS 2009	
VIDI Surveillance	**Award:** Good integration of open source tools for video analysis
US-Spray3D,Universität Stuttgart	**Award:** outstanding video analysis tool
University of Konstanz	

Done

List Benchmarks

Benchmark Details

Title: **CHI 97 Browse Off tree structure**

Provenance: University of Maryland, Human Computer Interaction Lab

Description : The dataset originally came from the 1997 CHI BrowseOff [Mullet 97] and consists of a hierarchy of concepts. It was very slightly edited to simplify the wording of some terms in the hierarchy that may have introduce some undue confusion when participants conducted the tasks.

The ground truth here is trivial: the path of the tree nodes participants were asked to find. more

Dataset available at : Link
Ground truth present : yes
Solution present : yes , Link to solution
Creation date : 2002
Datatype : text

Contact Information : Catherine Plaisant [plaisant@cs.umd.edu]

Edit Benchmark

Benchmark Uses

Add Benchmark use | Edit Benchmark use

Total number of uses: **1**

Used by:	Description
SpaceTree Experiment	This benchmark was used in a controlled experiment comparing 3 tree browsers: SpaceTree, Hyperbolic Browser and MS File Explorer. We provide the experimental procedure, worksheets and the executable of SpaceTree.

Papers

Add Paper | Edit Paper

Total number of papers: **2**

Citation
[Mullet 97] Mullet, K., Fry, C., Schiano, D. (1997) On your marks, get set, browse! (the great CHI'97 Browse Off), Panel description in ACM CHI'97 extended abstracts, ACM, New York, 113-114
Grosjean, J., Plaisant, C., Bederson, B., (April 2002) SpaceTree: Supporting Exploration in Large Node Link Tree, Design Evolution and Empirical Evaluation, Proceedings of IEEE Symposium on Information Visualization, 2002 pp. 57 -64

VAST 2010 Challenge

- Similar format
- Practice using previous datasets

- Deadlines for submission (June/July)
- Target dataset delivery in Spring (March?)

- Contact any of us if you have suggestions or questions and call your representative to continue to fund this activity…
- challengecommittee@cs.umd.edu

Want to learn more about Visual Analytics Evaluation via contests?

Want to learn more about Visual Analytics Evaluation via contests?

- SEMVAST project
- www.hcil.cs.umd.edu/hcil/semvast
- Blog
- Email list
- Papers e.g. Recent InfoVis paper about lessons learned from 2006-2008 VASTChallenges
- Visual Analytics Benchmark Repository
- Announcements

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- Accept position papers AND research papers

  Published in ACM Digital Library
- November deadline (>5)

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