

Manual work delegation to an AI-supported computer

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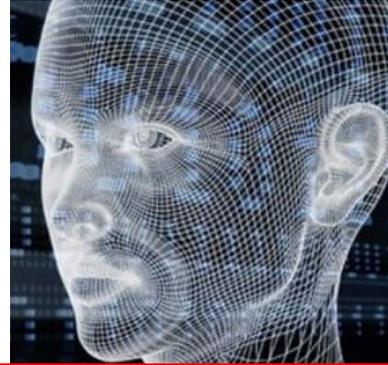
Myself

- B.S. from University of Hawaii at Manoa
- M.S. from Stanford University
- Ph.D. from Georgia Tech
- At UNLV since 2017

- My research interests lie in the use of information and emerging technologies to help various civil engineering problems where humans' capabilities lack.
- 10 years focused research on safety

Disruptive Technologies

- Intelligent Transportation Systems
- Autonomous and connected vehicles
- EVs
- Smart cities



Data Driven



We can/should do better beyond “road users”

- Uber/Lyft
- Autonomous driving
- Connected systems



Traffic
Infrastructure
Management

- Our limited capability
- Repetitive manual work

Crash Data Collection & Crash Data Analysis

Quantitative data (200+)

Event Number:		STATE OF NEVADA TRAFFIC ACCIDENT REPORT SCENE INFORMATION SHEET <small>Revised 1/14/04</small>				Accident Number:		
Code Revision:		<input type="checkbox"/> 1) Emergency Use <input type="checkbox"/> 1) Preliminary Report <input type="checkbox"/> 3) Resubmission <input type="checkbox"/> 1) Off and Run <input type="checkbox"/> 2) Rural <input type="checkbox"/> 2) Office Report <input type="checkbox"/> 2) Initial Report <input type="checkbox"/> 4) Supplement Report <input type="checkbox"/> 2) Private Property		<input type="checkbox"/> 1) Property <input type="checkbox"/> 2) Injury <input type="checkbox"/> 3) Fatal		Agency Name:		
Collision Date	Time	Day	Beat / Sector	<input type="checkbox"/> 1) County	<input type="checkbox"/> 2) City	Surface	Intersection	Paddle Markers
/ /						<input type="checkbox"/> 1) Asphalt <input type="checkbox"/> 2) Concrete <input type="checkbox"/> 3) Gravel <input type="checkbox"/> 4) Dirt <input type="checkbox"/> 5) Other	<input type="checkbox"/> 1) Four Way <input type="checkbox"/> 2) T <input type="checkbox"/> 3) I <input type="checkbox"/> 4) X <input type="checkbox"/> 5) Roundabout <input type="checkbox"/> 6) Other	<input type="checkbox"/> 1) None <input type="checkbox"/> 2) Left Side <input type="checkbox"/> 3) Right Side <input type="checkbox"/> 4) Both Sides <input type="checkbox"/> 5) Unknown
Mile Marker	# Vehicles	# Non Motorists	# Occupants	# Fatalities	# Injured	# Restrained	Access Control	
Occurred On: (Highway # or Street Name)							<input type="checkbox"/> 1) None <input type="checkbox"/> 2) Exit <input type="checkbox"/> 3) Exit <input type="checkbox"/> 4) Partial	
<input type="checkbox"/> 1) Parking Lot <input type="checkbox"/> 1) At Intersection With: <input type="checkbox"/> 2) Dr <input type="checkbox"/> 3) Exit <input type="checkbox"/> 4) Blind <input type="checkbox"/> 5) Approximate Of (Cross Street)								
Roadway Character	Roadway Conditions		Total Thru Lanes		Average Roadway Widths		Roadway Grade	
<input type="checkbox"/> 1) Curve & Grade	<input type="checkbox"/> 1) Dry	<input type="checkbox"/> 2) Snow	Main Road	Travel Lane	Ft	Relative To		

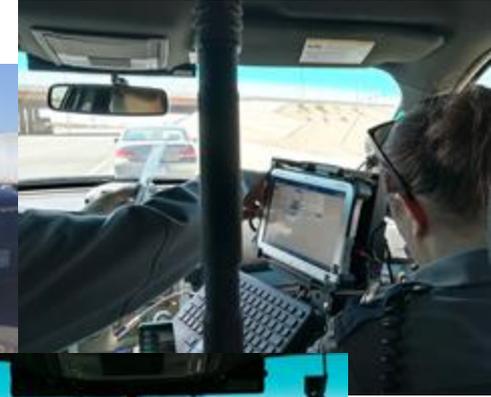
Description of Accident / Narrative Continuation



Qualitative data

Crash Data Collection & Crash Data Analysis

- Time consuming
 - Data collection (observing, entering, checking)
- Multiple activities
 - Traffic management, accident management, victim assistance

A grid of eight accident report forms, arranged in two rows of four. Each form is a detailed document with many fields for data entry, including sections for vehicle information, driver information, and accident details.

Our limited ability
Considerable manual process

Crash Data Collection & Crash Data Analysis

Further complications and challenges

- Unreliable data
 - Compromised data quality, missing/incomplete/wrong information
- Further analysis, and decision making
 - Understanding, countermeasures, political decisions
- Long exposure of officers to hazardous traffic
 - 8% of line-of-duty deaths are due to vehicles striking police officers while on foot.
- **All these matters are interconnected and interdependent**

Our limited ability
Considerable manual process

Crash Data Collection & Crash Data Analysis

My research

- Aims to introduce an automated approach to crash data collection
- By developing an AI-supported tool to delegate repetitive, manual work to AI-supported computers

Crash Data Collection & Crash Data Analysis

- Hypothetical scenarios (in fact, confirmed by DOTs)
 - NDOT better understand lane changes and their relations with crashes
 - MassDOT learned there are a considerable number of mismatching data between quantitative and qualitative data sets.
 - Distracted driving—texting, calling, smoking, eating, children?

P. Contributing Circumstances - Driver

1. No Improper Driving
2. Failed to Yield Right of Way
3. Disregarded Traffic Signs, Signals, Road Markings
4. Exceeded Authorized Speed Limit
5. Driving Too Fast for Conditions
6. Made an Improper Turn
7. Wrong Side or Wrong Way
8. Followed Too Closely
9. Failure to Keep in Proper Lane.
10. Operating Vehicle in Erratic, Reckless, Careless, Negligent or Aggressive Manner
11. Swerving or Avoiding Due to Wind, Slippery Surface, Vehicle, Object, Non-motorist in Roadway, etc
12. Under the Influence of Medication/Drugs/Alcohol
13. Visibility Obstructed
14. Inattention
15. Distracted
16. Fatigued, Asleep
17. Operating Defective Equipment
18. Other Improper Action
19. Technology Related Distraction
20. Unknown

- Texting?
- Smoking?
- Eating?
- Children?
- Stereo?

Crash Data Collection & Crash Data Analysis

● Use narratives

1. V1, a pickup, was traveling in the right-hand lane of northbound SR-7 following V2, a van. V2 slowed suddenly. D1 did not notice V2 slowing in time and swerved to the right to avoid striking V2. V1 struck a tree off the right side of the road. V1 veered off the tree and proceeded to cross over the center median grass striking V3 traveling in the right-hand southbound lane injuring the driver of V1. After being struck by V1, V3 struck the curb on the right-hand side of the road, crossed over the sidewalk, and struck a pedestrian and then a light pole. V2 did not know the crash had occurred and kept on driving.
2. V1, a firetruck returning from an emergency, was traveling west on Garden Parkway approaching the Mayberry Street underpass when a malfunction in the hydraulic system of its hook and ladder apparatus caused the ladder to swing to the right of the vehicle. When V1 went under the Mayberry Street overpass the ladder and bucket struck the bottom of the bridge, breaking on the top portion of the ladder. The ladder piece struck the right front quarter panel of V2, which was following directly behind V1. V2 lost control and struck the underpass bridge abutment on the eastbound side of the road.
3. D1 was stopped at the stop sign on the south end of the bypass road around the King's Mine Overpass construction. Upon entering US-41 with the intention of crossing over the northbound lanes and then turning to the south, D1 failed to see V2 northbound on US-41. V2 struck the front driver's side of V1 causing it to spin clockwise. D1 was either unconscious or disoriented. D1 apparently had her foot on the accelerator and went approximately 1,000 feet to the north in the median and then crossed over northbound US-41. After crossing the northbound lanes, V1 started up the ramp at the King's Mine Interchange which is currently closed for construction. V1 went head-on into the guardrail end terminal on the west side of the ramp.

Extract

- I was dispatched to the area for the report of a motor vehicle crash involving truck board.
- The second vehicle involved was a school bus, the reports marked "non-school bus" owned by a transportation company. The driver was ejected to the passenger side of the motor vehicle.
- A female citizen involved in an MVA with a school bus shortly before her arrival.
- He again stated he did not remember being speaking to me, I detected a strong odor of an alcoholic beverage coming from the vehicle. I formed the opinion that he was intoxicated by the influence of an intoxicating beverage.
- I smelled a strong odor of alcohol. She called her brother and stated she was drunk and going to be in trouble because she was driving and involved in a crash. She was issued a criminal citation for liquor and negligent operation of a motor vehicle.

Examples of errors impacting downstream analysis

How can we do better?

Crash Data Collection

- Manual data collection
- Time constraint
- Repetitive
- Errors, safety issues, unreliable historical data

Crash Data Analysis

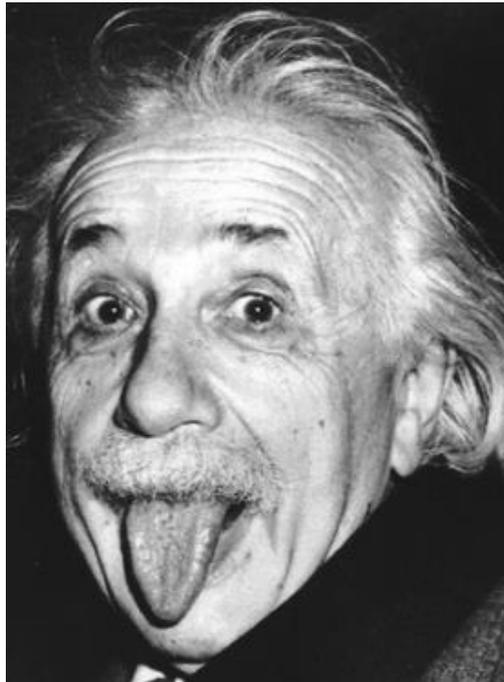
- Manual reading
- Time constraint
- Repetitive
- Subjectivity, unreliable

Delegate repetitive, manual work to AI-supported computers

Our limited ability
Considerable manual process

Human + Computer Interaction

Albert Einstein



7 ± 2

Number of **items** an average human holds in **working memory**

George Miller, 1956

“Computers are incredibly fast, accurate, and stupid.

Human beings are incredibly slow, inaccurate, and brilliant.

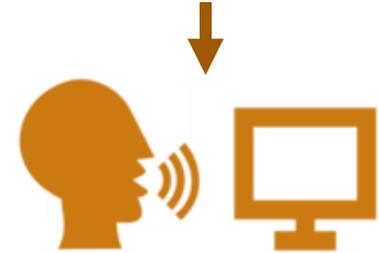
Together they are powerful beyond imagination.”

Multi-phase Systematic Development

- Phase 1: Prompted input

- Determine the portions of the reports that can be efficiently collected via SR
- Tailor SR models for reliable recognition of crash attributes
- Create a processing platform to implement the tailored SR models
- Validate the platform

The image shows a 'Crash Report' form with various sections. Orange boxes highlight specific areas: the top right section (likely 'Crash Location'), the middle left section (likely 'Crash Description'), and the bottom left section (likely 'Crash Details').



The diagram shows the output of the SR processing platform. It consists of three horizontal bars with a microphone icon on the left. The first bar is labeled 'Collision type:' and has radio buttons for 'Head-on', 'Rear-end' (which is checked), and 'Angle ...'. The second bar is labeled 'Roadway Conditions:' and has radio buttons for 'Dry', 'Icy', and 'Wet ...'. The third bar is labeled 'Surface:' and has radio buttons for 'Asphalt', 'Concrete', and 'Gravel ...'.

Data collection tool

CRASH DATA ELEMENTS

C1. Crash Identifier

C2. Crash Classification

S1 Ownership
 01 Public Property
 02 Private Property

S2 Characteristics
 01 Trafficway, On Road
 02 Trafficway, Not on Road
 03 Non-Trafficway

S3 Secondary Crash?
 01 No
 02 Yes

C3. Crash Date and Time

S4 Crash Date and Time (YYYYMMDDHHMM)

S5 Time of Roadway Clearance (HHMM)

C4. Crash County

C5. Crash City/Place (Political Jurisdiction)

C6. Crash Location

Latitude (degrees, minutes, seconds + compass direction)

Longitude (degrees, minutes, seconds + compass direction)

C7. First Harmful Event

C8. Location of First Harmful Event Relative to the Trafficway

C12. Light Condition

C15. Relation to Junction

C13. Roadway Surface Condition

C9. Manner of Crash/ Collision Impact

C11. Collision With Person, Motor Vehicle, or Non-Fixed Object

09 Animal (live)
 10 Construction Equipment (backhoe, bulldozer, etc.)
 11 Farm Equipment (tractor, combine harvester, etc.)
 12 Motor Vehicle in Transport

01 Cargo/Equipment Loss or Shift
 02 Field/Lumped From Motor Vehicle
 03 Fire/Explosion
 04 Immersion, Full or Partial
 05 Jackknife
 06 Other Non-Collision
 07 Overturn/Rollover
 08 Thrown or Falling Object

01 Gone
 02 In Parking Lane or Zone
 03 Median
 04 Off-Roadway, Location Unknown
 05 On Roadway
 06 On Shoulder, Left Side
 07 On Shoulder, Right Side
 08 Outside Road/Right-of-Way
 09 Roadside
 10 Separator/Traffic Island
 99 Unknown

01 Daylight
 02 Dawn/Dusk
 03 Dark - Lighted
 04 Dark - Not Lighted
 05 Dark - Unknown Lighting
 98 Other
 99 Unknown

01 Acceleration/Deceleration Lane
 02 Crossover-Related
 03 Driveway Access or Related
 04 Entrance/Exit Ramp or Related
 05 Intersection or Related
 06 Non-Junction
 07 Railway Grade Crossing
 08 Shared-Use Path or Trail
 09 Through Roadway

01 No
 02 Yes
 99 Unknown

01 Within Interchange Area?

01 No
 02 Yes
 99 Unknown

01 Acceleration/Deceleration Lane
 02 Crossover-Related
 03 Driveway Access or Related
 04 Entrance/Exit Ramp or Related
 05 Intersection or Related
 06 Non-Junction
 07 Railway Grade Crossing
 08 Shared-Use Path or Trail
 09 Through Roadway

01 Dry
 02 Ice/Frost
 03 Mud, Dirt, Gravel
 04 Oil
 05 Sand
 06 Slush
 07 Snow
 08 Water (standing, moving)

00 Not a Collision Between Two Motor Vehicles

https://transit.ce.unlv.edu/sr/

Audio Data Collection

Access token: abcde User: Cristian Arteaga

Item #1/50

Say: "Public Property"

Record

0:00

ID	Status	Field
1	Done	Public Property
2	Done	Private Property
3	Done	Trafficway, On Road
4	Done	Trafficway, Not on Road

Part-time Undergraduate students:

Monserat, Alberto, Elijah, Brianna,
 Kendal, Abraham, Marc, Christian



Work delegation to AI-supported computers

- Data Analysis – semantic search by AI

Query:

“The vehicle departed its traveling lane”

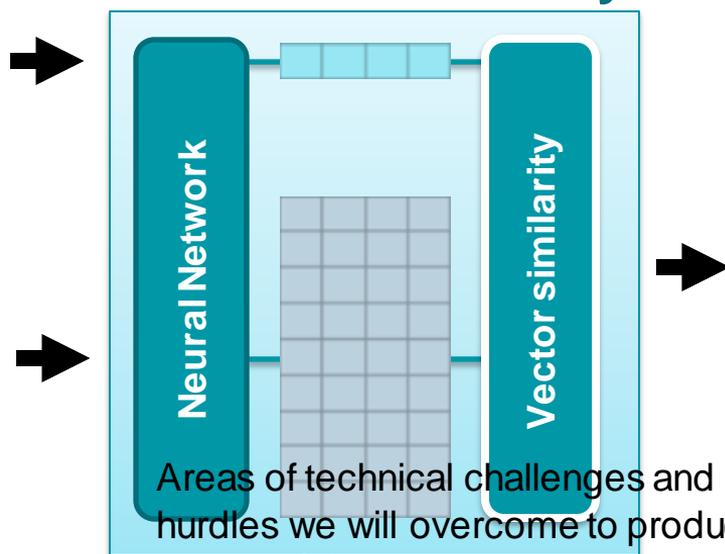
Narratives

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3. D1 was stopped at the stop sign on the south end of the bypass road around the King's Mine Overpass construction. Upon entering US-41 with the intention of crossing over the northbound lanes and then turning to the south, D1 failed to see V2 northbound on US-41. V2 struck the front driver's side of V1 causing it to spin clockwise. D1 was either unconscious or disoriented. D1 apparently had her foot on the accelerator and went approximately 1,000 feet to the north in the median and then crossed over northbound US-41. After crossing the northbound lanes, V1 started up the ramp at the King's Mine Interchange which is currently closed for construction. V1 went head-on into the guardrail end terminal on the west side of the ramp.

Semantic Similarity



Areas of technical challenges and hurdles we will overcome to produce successful output

Find answers

1. V3 veered over the solid yellow line and struck the ...
2. V2 was unable to maintain lanes ...
3. V1 veered to the left, crossed over to the left shoulder, then
4. V2 crossed the center line and went onto the shoulder ...
5. V2 veered into the median, overcorrected, and veered ...
6. V1 traveling westbound went into the eastbound lane and collided ...

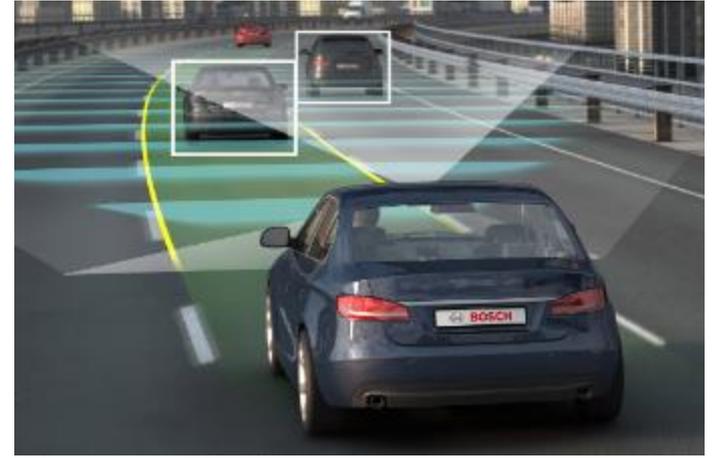
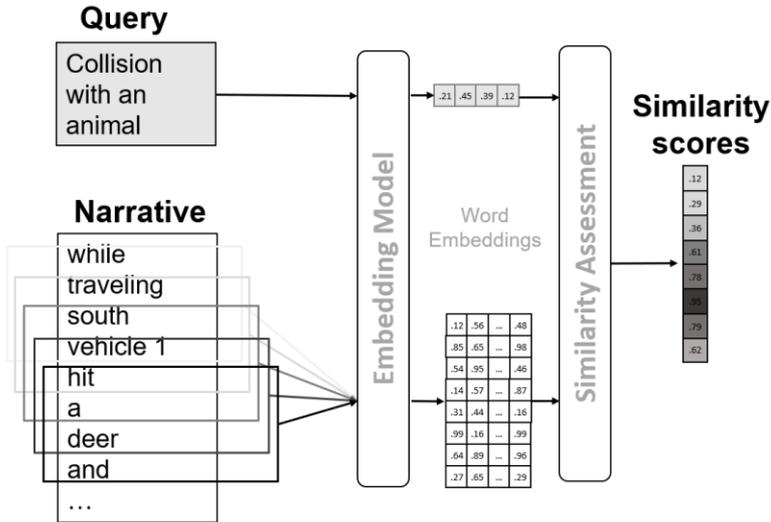
Multi-phase Systematic Development

- Phase 1: AI-based semantic model / application
 - Identify state-of-the-art AI techniques for semantic search extensive text data
 - Implement the query-based approach for semantic search in crash narratives
 - Validate the proposed application in real-life settings



Technical challenges (1)

- What is we see and understand is different from what computers see and understand



Artificial Intelligence in Cars: Examples of AI in the Auto Industry

Artificial intelligence and self-driving cars are becoming synonymous. Find out the latest ways AI is shaking up the auto industry.



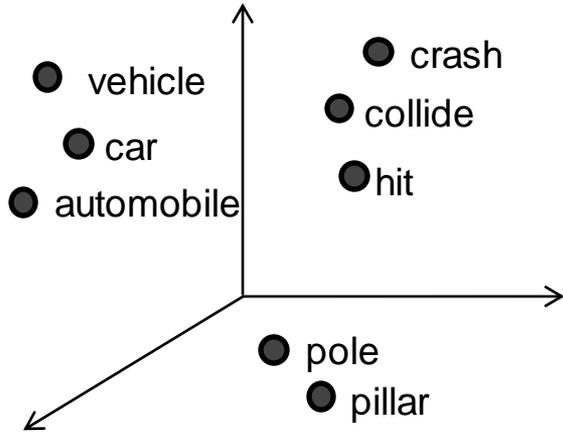
Technical Challenges (2)

- Complexity in language expression
- V1 veered to the left, crossed over to the left shoulder, then hit a tree.
- V2 was operating at high speeds and was unable to maintain lanes ...
- V2 crossed the center line and went onto the shoulder of the opposite lane.
- V2 veered into the median, overcorrected, and veered right into the shoulder.
- V1 traveling westbound went into the eastbound lane and collided head-on...
- V3 crossed the yellow line and hit the front of an upcoming car.

We need computers to be smart and adaptive to understand semantic information from human language beyond simple keywords match

Ongoing technical investigation

- Word Embeddings

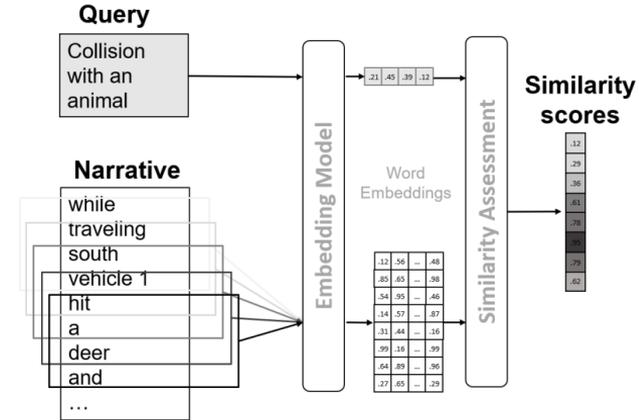


vehicle	0
hit	1
crash	2
pole	3
collide	4
car	5
pillar	6
...	...

embedding dimension

.12	.56	...	.48
.85	.65	...	.98
.54	.95	...	.46
.14	.57	...	.87
.31	.44	...	.16
.99	.16	...	.99
.64	.89	...	.96
.27	.65	...	.29

vocabulary size



Data attribute studies...
Portions of data for SR

Open-Source SR models

Open-Source Model	Company	Word Error Rate
Wav2Vec 2.0	 Meta AI	2.1
Whisper	 OpenAI	2.7
UniSpeech	microsoft/ UniSpeech  <small>UniSpeech - Large Scale Self-Supervised Learning for Speech</small>	3.7

Expected benefit from successful outcome

- Considerable effective data collection & analysis methods
- Remove manual process
 - Reading hundreds/thousands narratives
 - Data collection
- Quick, effective, accurate, safe, and reliable
- More vigilant and robust practice given pressuring and hectic onsite activities
- Practice supported by technological advances and innovation
- Automated process supported by AI

Q&A

- My research also include work-zone safety that implements emerging technologies. Feel free to contact me if there is anything we can discuss
 - Struck by accidents!!! (many real-life accidents) – repair cracks
- Special Thanks for OTS, NDOT, Kimley horn (Kevin, Peter, Amy, Lacey, Mike and others)

Can computers understand human language?

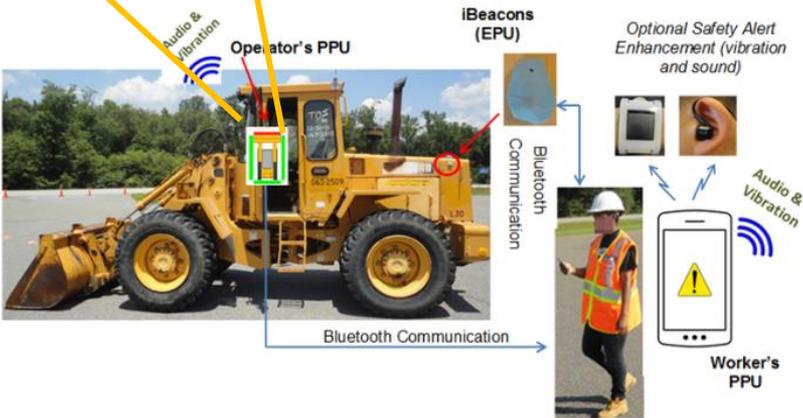
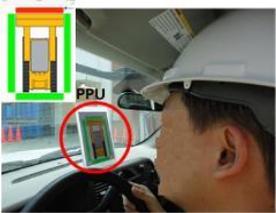
An AI model generated this image based on the description:

A robot couple fine dining with the Eiffel Tower in the background.



Imagen

Collision Accident Prevention



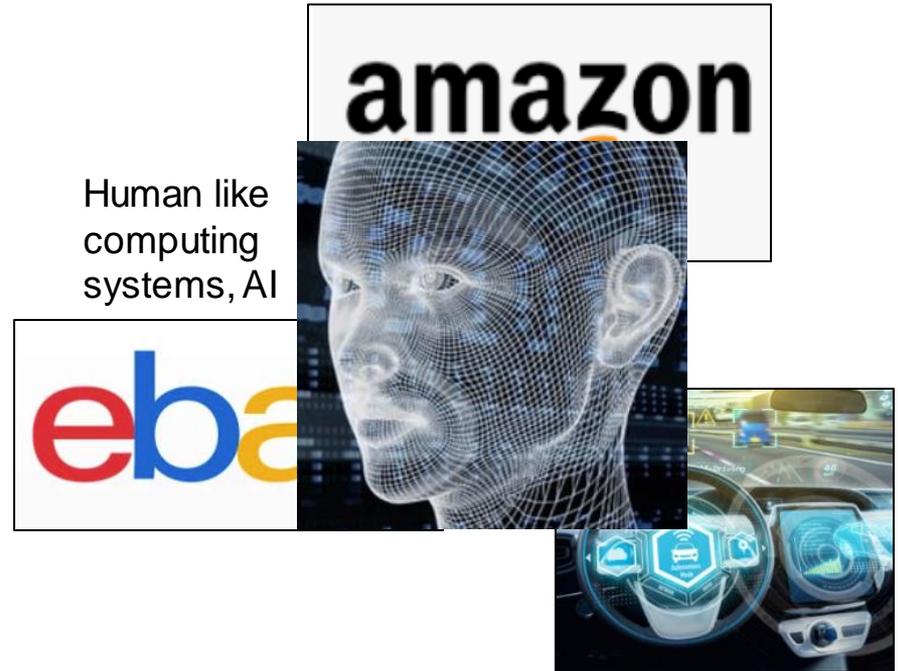
**SR-assisted
collection of
crash reports**

**Semantic
search for crash
narratives**

UNLV CEEC, Jay Park

Evolution of AI

- Better shopping experience
 - Find products
 - Better price, more selections
- Smarter --> Autopilot
 - Taking more parts of lives
 - Arguably, safer and more convenient
- Realized by
 - State-of-the-art techniques(e.g., AI)
 - Together with data
- Unlimited potential ahead in future



MA crash narrative

1. V1, a pickup, was t

1. V1, a pickup, wa
V2, a van. V2 slo
to the right to a
veered off the t
V3 traveling in t
being struck by
over the sidewa

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2. V1, a firetruck r
Parkway approa
hydraulic syste
swing to the rig
top portion of t
V2, which was f
underpass brid

3. underpass brid

3. D1 was stopped
King's Mine Ove
crossing over the r
see V2 northbound
spin clockwise. D1 was e
foot on the accelerator and
median and then crossed over
lanes, V1 started up the ramp at
closed for construction. V1 went h
west side of the ramp.

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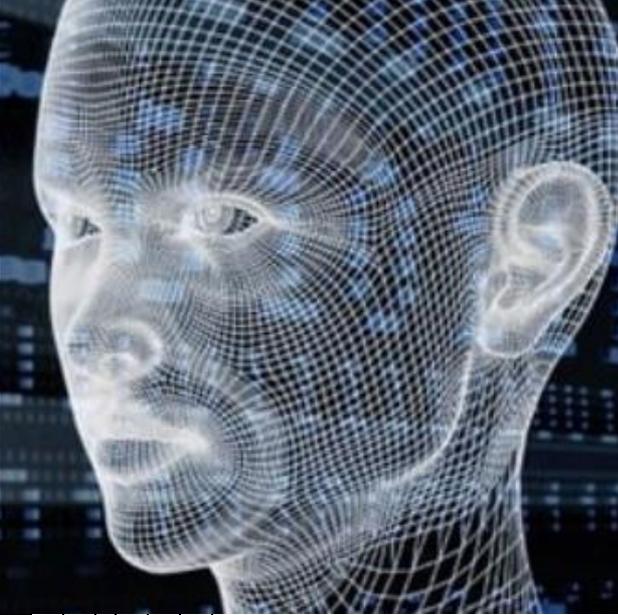
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sions

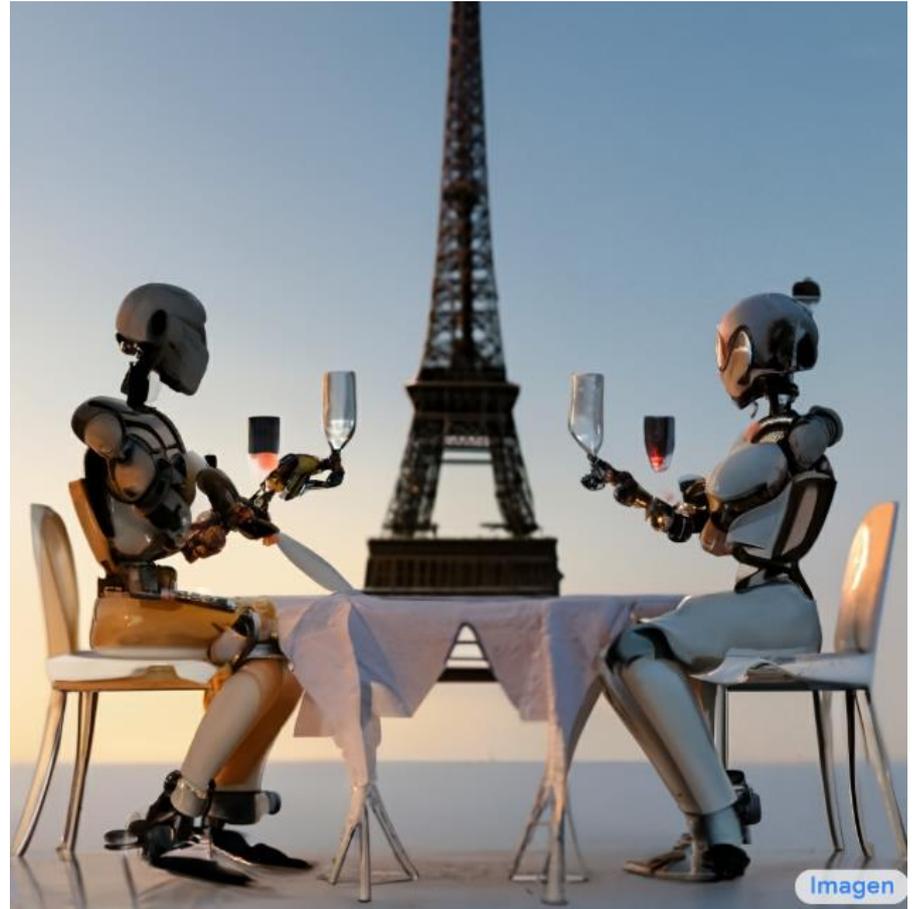
see V2 northbound on US-41. V2 struck the front driver's side of V1 causing it to spin clockwise. D1 was either unconscious or disoriented. D1 apparently had her foot on the accelerator and went approximately 1,000 feet to the north in the median and then crossed over northbound US-41. After crossing the northbound lanes, V1 started up the ramp at the King's Mine Interchange which is currently closed for construction. V1 went head-on into the guardrail end terminal on the west side of the ramp.

Big picture...

Can computers understand human language?

An AI model generated this image based on the description:

A robot couple fine dining with the Eiffel Tower in the background.



SR-assisted collection of crash reports

Current practice—Nevada Crash Report Form

The image displays eight copies of the Nevada Traffic Accident Report form, arranged in two rows of four. Each form is a detailed document with numerous fields for data entry, including sections for vehicle information, driver details, accident description, and witness statements. The forms are densely packed with text and checkboxes, illustrating the high volume of data collected for each incident.



Challenges for crash data collection:

- 200+ fields to be collected
- Manual typing on software
- Officers have multiple and time-sensitive activities at a crash scene





Problems with collected data

Query: Driving under influence of alcohol

Results:

He again stated he did not remember being in the crash. While he was speaking to me, I detected a strong odor of an alcoholic beverage coming from his mouth. Based on a sobriety test, I formed the opinion that he was **operating a motor vehicle under the influence of an intoxicating beverage.**

I smelled a strong odor of alcohol in her breath. She called her brother and stated she was drunk and going to be in trouble because she was driving and involved in a crash. She was issued a **criminal citation for liquor and negligent operation of a motor vehicle.**

Deficiencies in Florida Pedestrian Crash Data

Factor	% Error
DUI involvement/pedestrian	52%
Pedestrian at fault	44%
DUI involvement/driver	23%
Posted speed limit	22%
Speeding related	12%

Spainhour and Wootton (2007)

Problems

Further complications and challenges

- Unreliable data
 - Compromised data quality, Mismatching information
- Exposure of officers to hazardous traffic
- Further analysis, and decision making
 - Understanding, countermeasures, political decisions,



Our proposed solution

Phase 1

Prompted inputs

Collision type: Head-on Rear-end Angle ...

 Roadway Conditions: Dry Icy Wet ...

Surface: Asphalt Concrete Gravel ...

Phase 2

Narrated inputs

Rear-end ⁽¹⁾ fatal ⁽²⁾ crash located at Flamingo Road ⁽³⁾, 500 feet ⁽⁵⁾ from Maryland Parkway ⁽⁴⁾ in an urban area ⁽⁶⁾. The road is a three-lane ⁽⁸⁾ arterial road ⁽⁷⁾, paved ⁽⁹⁾, straight ⁽¹⁰⁾, and level ⁽¹¹⁾, with broken-white lane markings ⁽¹²⁾, left-side paddle markings ⁽¹³⁾, and paved shoulders ⁽¹⁴⁾. The crash occurred at daylight ⁽¹⁵⁾, with rainy weather ⁽¹⁶⁾, low visibility ⁽¹⁷⁾, and wet road ⁽¹⁸⁾.

Phase 3

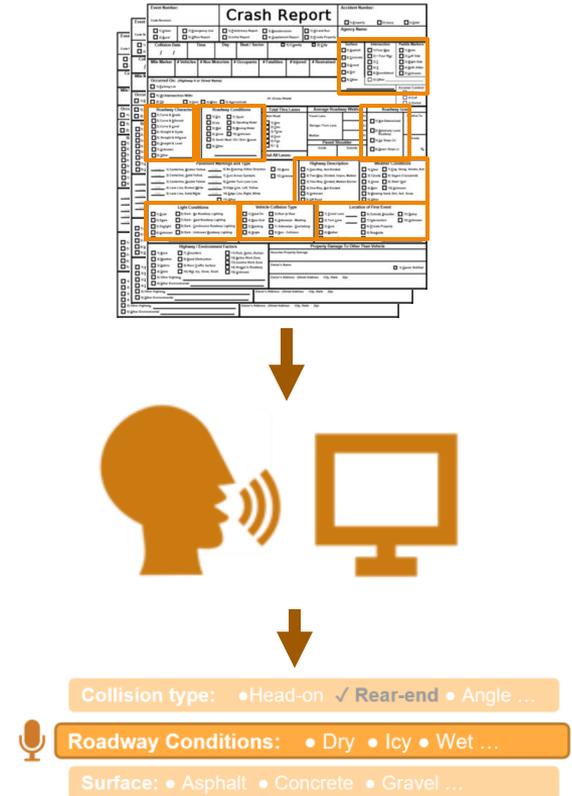
Expand for extra data items

Citations

Witness Statements

Project Objectives (Phase 1)

- Determine the portions of the reports that can be efficiently collected via SR
- Tailor SR models for reliable recognition of crash attributes
- Create a processing platform to implement the tailored SR models
- Validate the platform



Semantic search for crash narratives

The problem

1. V1, a pickup, was traveling in the right-hand lane of northbound SR-7 following V2, a van. V2 slowed suddenly. D1 did not notice V2 slowing in time and swerved to the right to avoid striking V2. V1 struck a tree off the right side of the road. V1 veered off the tree and proceeded to cross over the center median grass striking V3 traveling in the right-hand southbound lane injuring the driver of V1. After being struck by V1, V3 struck the curb on the right-hand side of the road, crossed over the sidewalk, and struck a pedestrian and then a light pole. V2 did not know the crash had occurred and kept on driving.
2. V1, a firetruck returning from an emergency, was traveling west on Garden Parkway approaching the Mayberry Street underpass when a malfunction in the hydraulic system of its hook and ladder apparatus caused the ladder to raise and swing to the right of the vehicle. When V1 went under the Mayberry Street overpass the ladder and bucket struck the bottom of the bridge, breaking off the top portion of the ladder. The ladder piece struck the right front quarter panel of V2, which was following directly behind V1. V2 lost control and struck the underpass bridge abutment on the eastbound side of the road.
3. D1 was stopped at the stop sign on the south end of the bypass road around the King's Mine Overpass construction. Upon entering US-41 with the intention of crossing over the northbound lanes and then turning to the south, D1 failed to see V2 northbound on US-41. V2 struck the front driver's side of V1 causing it to spin clockwise. D1 was either unconscious or disoriented. D1 apparently had her foot on the accelerator and went approximately 1,000 feet to the north in the median and then crossed over northbound US-41. After crossing the northbound lanes, V1 started up the ramp at the King's Mine Interchange which is currently closed for construction. V1 went head-on into the guardrail end terminal on the west side of the ramp.

Crash narratives contain **useful information**, but extracting this information is challenging.

- Large amounts of data
- Language variability
- Reading is time-consuming and prone to subjectivity

The problem

Example: How to identify lane-departure crashes?

- V1 veered to the left, crossed over to the left shoulder, then hit a tree.
- V2 was operating at high speeds and was unable to maintain lanes ...
- V2 crossed the center line and went onto the shoulder of the opposite lane.
- V2 veered into the median, overcorrected, and veered right into the shoulder.
- V1 traveling westbound went into the eastbound lane and collided head-on...
- V3 crossed the yellow line and hit the front of an upcoming car.

Keyword search is challenging (which keywords to use and combine?)



Our proposed solution

Search based on semantic similarity

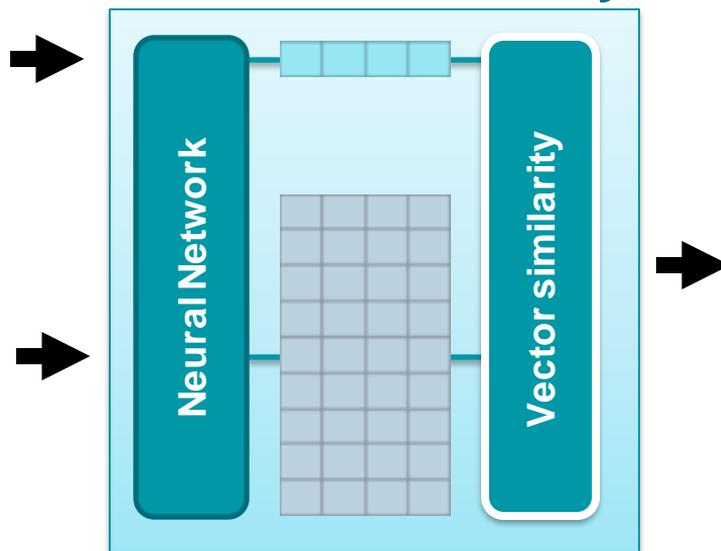
Query:

“The vehicle departed its traveling lane”

Narratives

1. V1, a pickup, was traveling in the right-hand lane of northbound SR-7 following V2, a van. V2 slowed suddenly. D1 did not notice V2 slowing in time and swerved to the right to avoid striking V2. V1 struck a tree off the right side of the road. V1 veered off the tree and proceeded to cross over the center median grass striking V3 traveling in the right-hand southbound lane injuring the driver of V1. After being struck by V1, V3 struck the curb on the right-hand side of the road, crossed over the sidewalk, and struck a pedestrian and then a light pole. V2 did not know the crash had occurred and kept on driving.
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Semantic Similarity



Ranking

1. V3 veered over the solid yellow line and struck the ...
2. V2 was unable to maintain lanes ...
3. V1 veered to the left, crossed over to the left shoulder, then
4. V2 crossed the center line and went onto the shoulder ...
5. V2 veered into the median, overcorrected, and veered ...
6. V1 traveling westbound went into the eastbound lane and collided ...

Our proposed solution

Phase 1

Develop an AI-based prototype application for semantic search in crash narratives



Phase 2

Foster an extensive adoption of the proposed approach by State agencies and relevant authorities



Project Objectives (Phase 1)

- Identify state-of-the-art AI techniques for semantic search extensive text data
- Implement the query-based approach for semantic search in crash narratives
- Validate the proposed application in real-life settings



Fix potential errors using semantic search

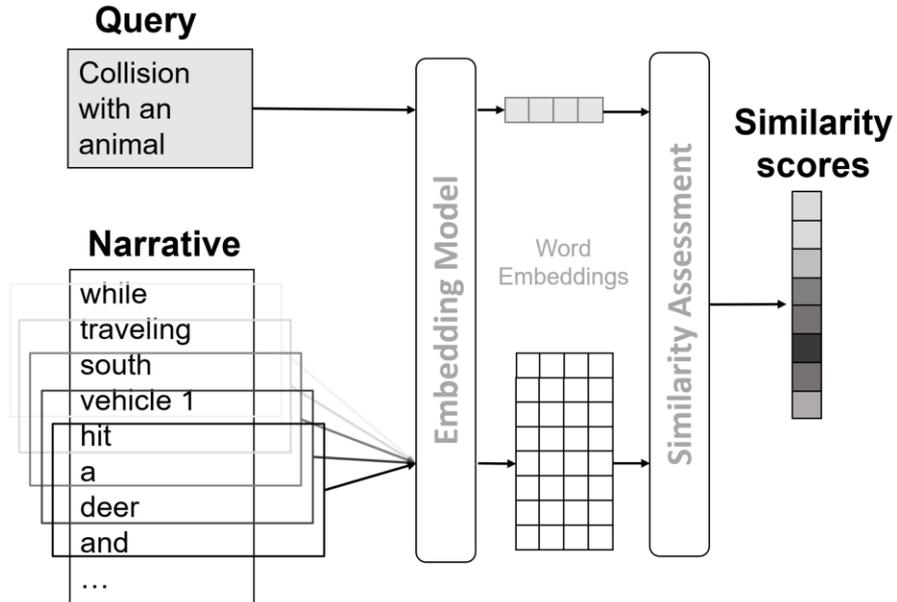
The records below were originally miscoded as not involving school buses, but the contents on the narratives, explored using semantic search, say otherwise. These records are from a real dataset.

School bus involved



- I was dispatched to the area for the report of a motor vehicle crash involving a truck and school bus with children on board.
- The second vehicle, a 2016 yellow school bus, owned by a transportation company. The bus had damage to the passenger side of the motor vehicle
- A female citizen was reporting that she had been involved in an MVA with a school bus shortly before her arrival.

Illustration of the semantic search approach



Q&A