

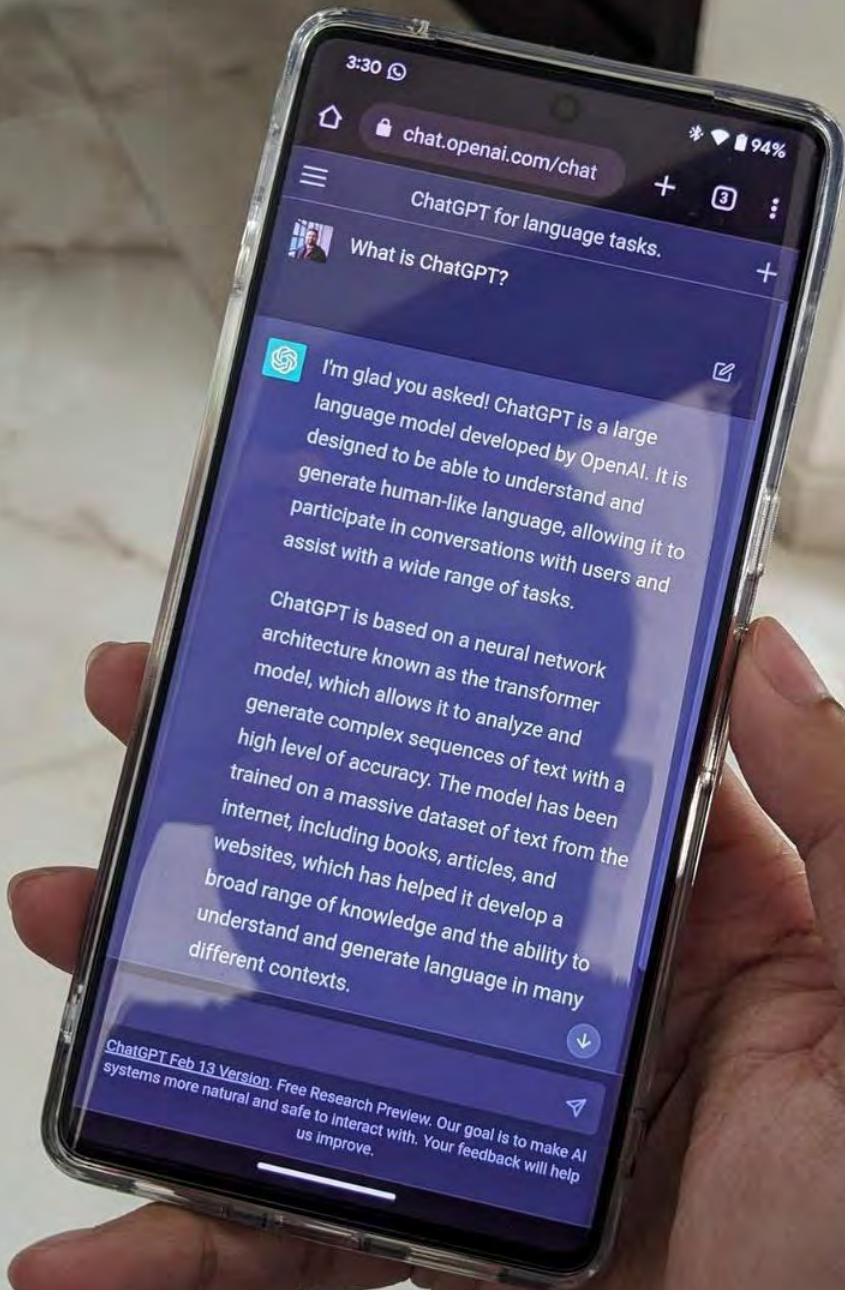
AI for Communities: Using the Right Tool for the Job

Tom Sanchez, PhD, AICP
twsanchez@tamu.edu





Brief History



tec
and

New chat

Model: GPT-4



How will urban planners use AI in the future?



Urban planners will increasingly use AI in the future to help create more efficient, sustainable, and livable cities. While the exact applications will continue to evolve, here are some key areas where AI can be expected to play a significant role:

Introduction and Overview


- Overview of AI as a tool for urban/community applications
- Definition of AI and its core “functionalities”





What is AI?

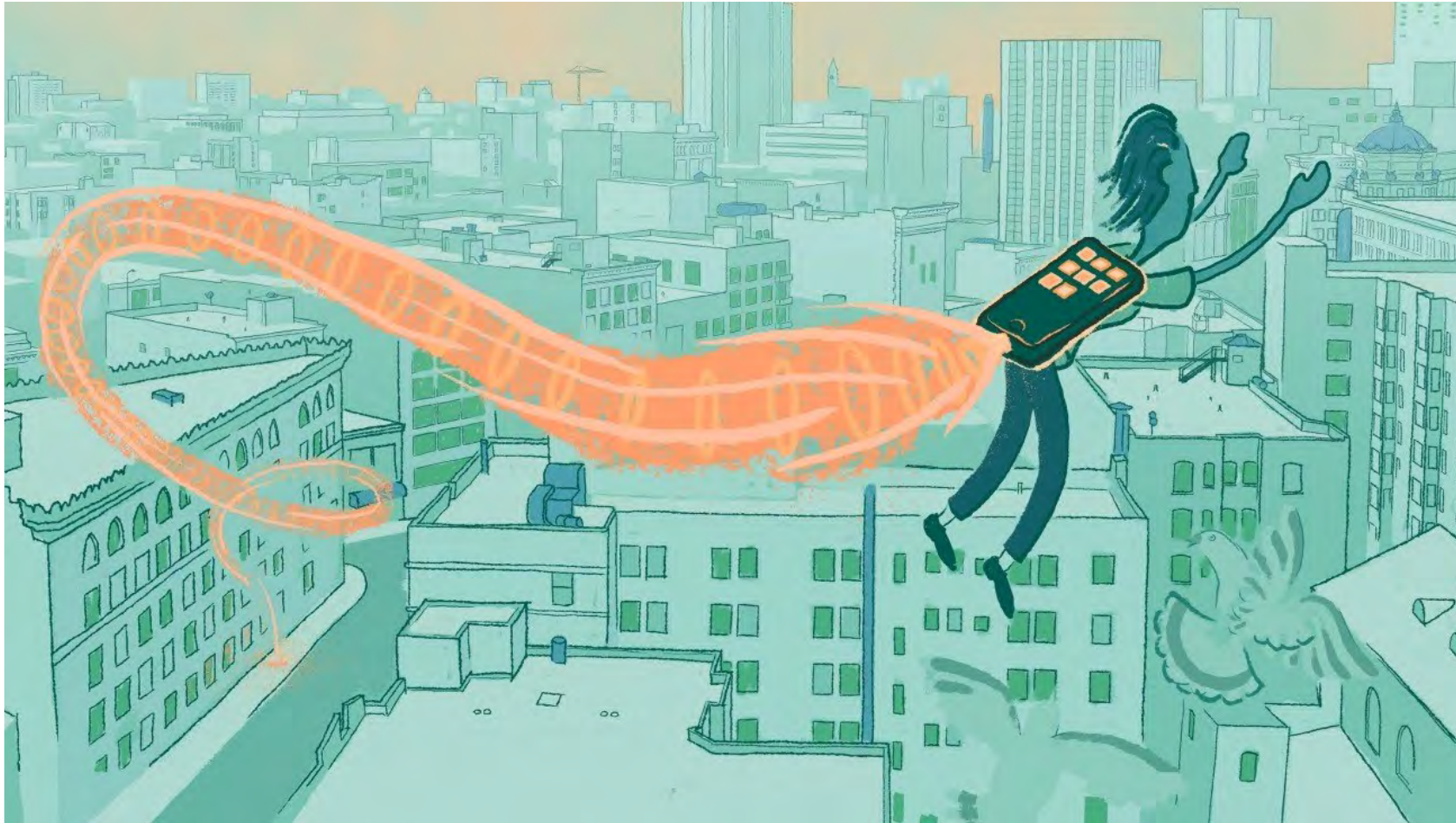
Artificial intelligence (AI) refers to computer systems capable of performing tasks that typically require human intelligence, such as reasoning, learning, problem-solving, and understanding language.



AI “in the city”

- **San Francisco, USA - Autonomous Vehicle Planning**
- Amsterdam, Netherlands - Smart City Initiatives
- Singapore - Virtual Simulation for Urban Planning
- Los Angeles, USA - Predictive Policing for Safety Planning
- Barcelona, Spain - IoT for Urban Services

San Francisco, USA - Autonomous Vehicle Planning



Source: <https://www.sfcta.org/policies/emerging-mobility>

California agency approves San Francisco robotaxi expansion amid heavy opposition

PUBLISHED THU, AUG 10 2023 10:44 PM EDT

REUTERS

SHARE



In an aerial view, Waymo autonomous vehicles sit parked in a staging area on June 08, 2023 in San Francisco, California.

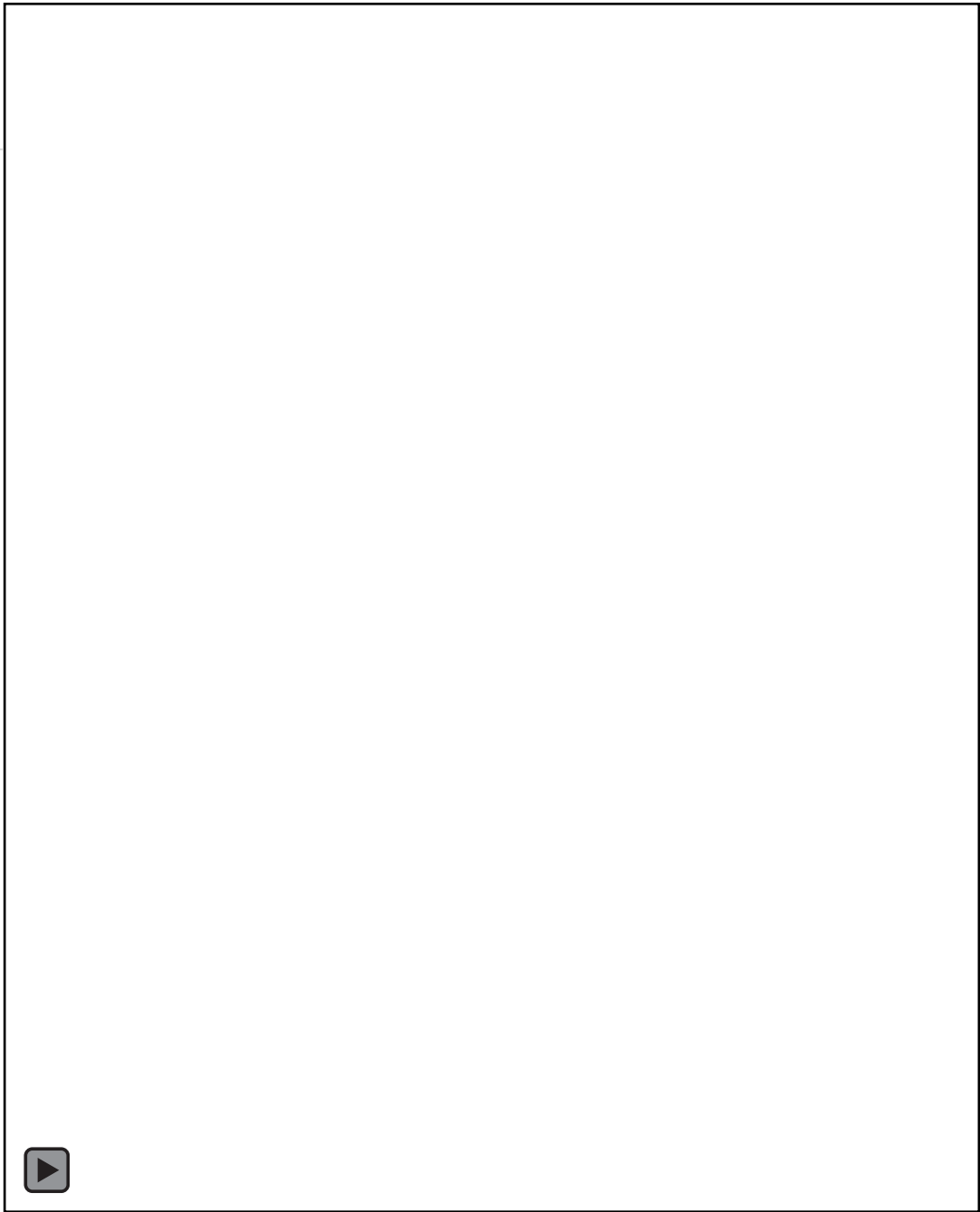
Justin Sullivan | Getty Images

[Alphabet Inc's](#) [Wavmo](#) and [General Motors' Cruise](#) can operate paid robotaxi

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11:00 am ET

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IN AS EARLY AS
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- Barcelona, Spain - IoT for Urban Services

Amsterdam Smart City



Let's create
better streets,
neighbourhoods
and cities

Amsterdam Smart City is an o
together innovation professio
knowledge institutions and civ
city and region of the future.

We offer a meeting place and
challenges and solutions. Via
sustainability professionals sh




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  Oct 5th

Event in Pakhuis De Zwijger by Natalia Garcia.

Posted on September 7th 2017

More info 

 3 

Collaborative Economy & Artificial Intelligence by shareNL




The shareNL meetup on 'Collaborative Economy & Artificial Intelligence' will be held at the 5th of October at Pakhuis de Zwijger in Amsterdam. You can already sign up on www.meetup.com/sharenl

Please stay tuned for more details.

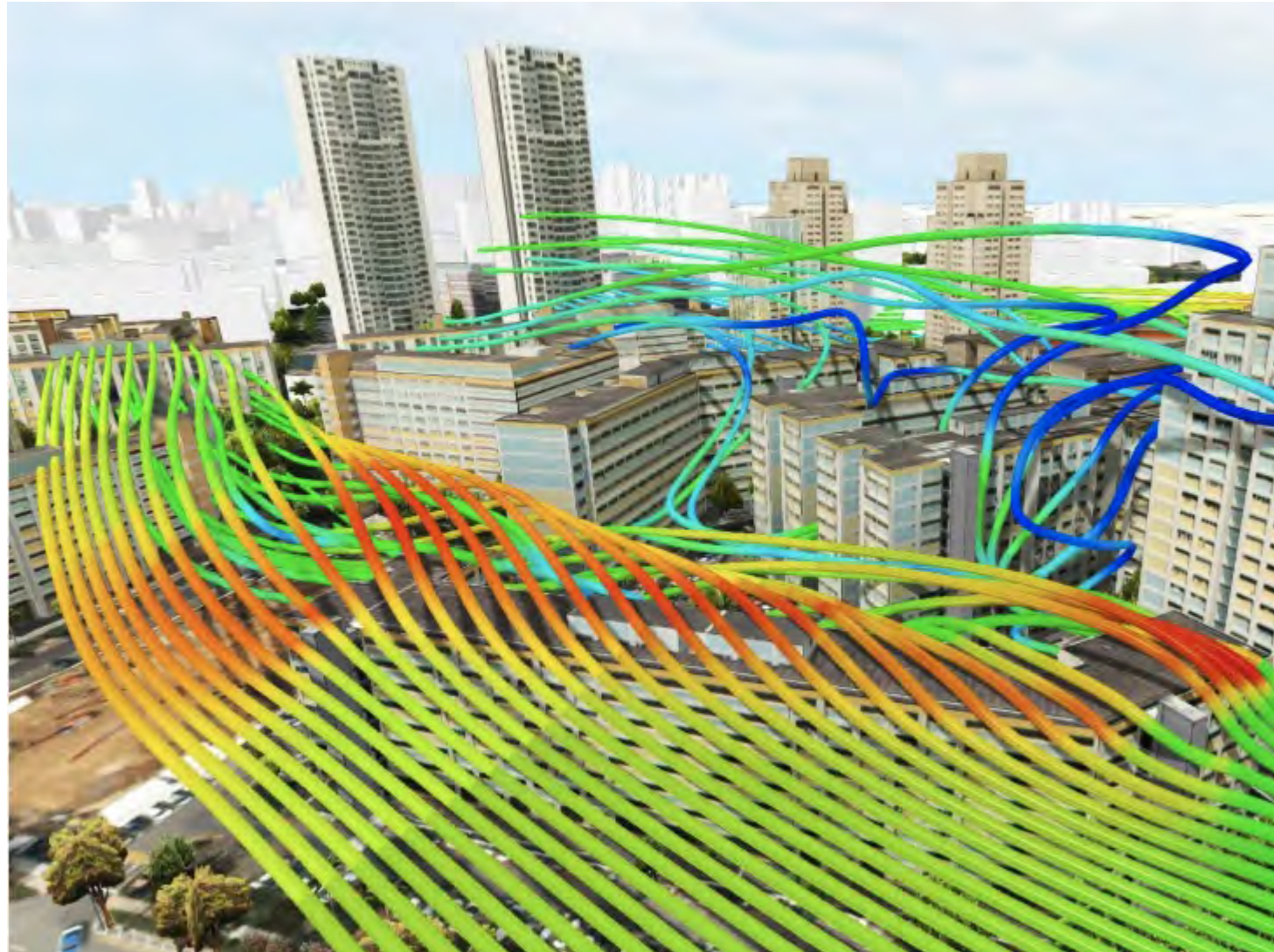
Do you want to be part of the program of this meetup? Email us at [masked].



AI “in the city”


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 - Amsterdam, Netherlands - Smart City Initiatives
 - **Singapore - Virtual Simulation for Urban Planning**
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 - Barcelona, Spain - IoT for Urban Services
- 

Singapore - Virtual Simulation for Urban Planning





AI “in the city”

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 - Singapore - Virtual Simulation for Urban Planning
 - **Los Angeles, USA - Predictive Policing for Safety Planning**
 - Barcelona, Spain - IoT for Urban Services
- 



Program Profile: Predictive Policing Model in Los Angeles, Calif.

Evidence Rating: Promising - One study

Date: This profile was posted on November 28, 2022

Program Summary

This program involved the use of a crime forecasting model to direct police patrol to dynamic hot spots to reduce crime. The program is rated Promising. There were statistically significant reductions in daily crime volume (specifically burglary, car theft, and burglary-theft from vehicle) for police patrols in the treatment condition, compared with patrols in the control condition.

Program Snapshot

Geography: Suburban,
Urban

Setting (Delivery):
High Crime

LAPD ended predictive policing programs amid public outcry. A new effort shares many of their flaws



AI “in the city”

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- Los Angeles, USA - Predictive Policing for Safety Planning
- **Barcelona, Spain - IoT for Urban Services**

DISRUPTIVE TECHNOLOGIES FOR INDUSTRY CHALLENGES

Industry IoT · Artificial Intelligence · Renewable Energy · Cloud Computing ·
Cybersecurity · Big Data · Augmented Reality · Robotic Process Automation · 5G
Technologies · Edge Computing · Digital Twin

EXHIBIT

EVENT FOLDER



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Choosing the right tool for the job

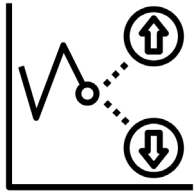
Create an image that shows a variety of objects that can be attached to wood including a screw, a hook, a small piece of wood, a nail, etc. all things that require a different sort of tool to be attached to the wood. Also include a banana as an obvious object that cannot be attached or used as a tool.

That's a great image, please include a screwdriver.

Use the first image and add a screwdriver to the mix.



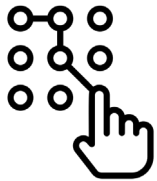
AI Functionalities



Predictive analysis



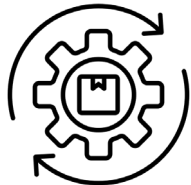
Idea Generation



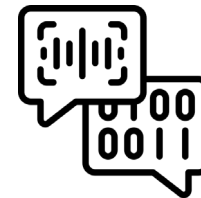
Pattern recognition



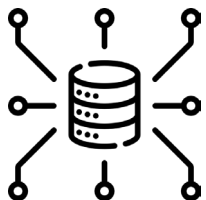
Decision support



Automate analysis tasks



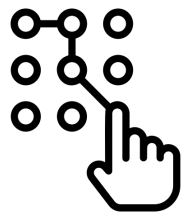
Language processing



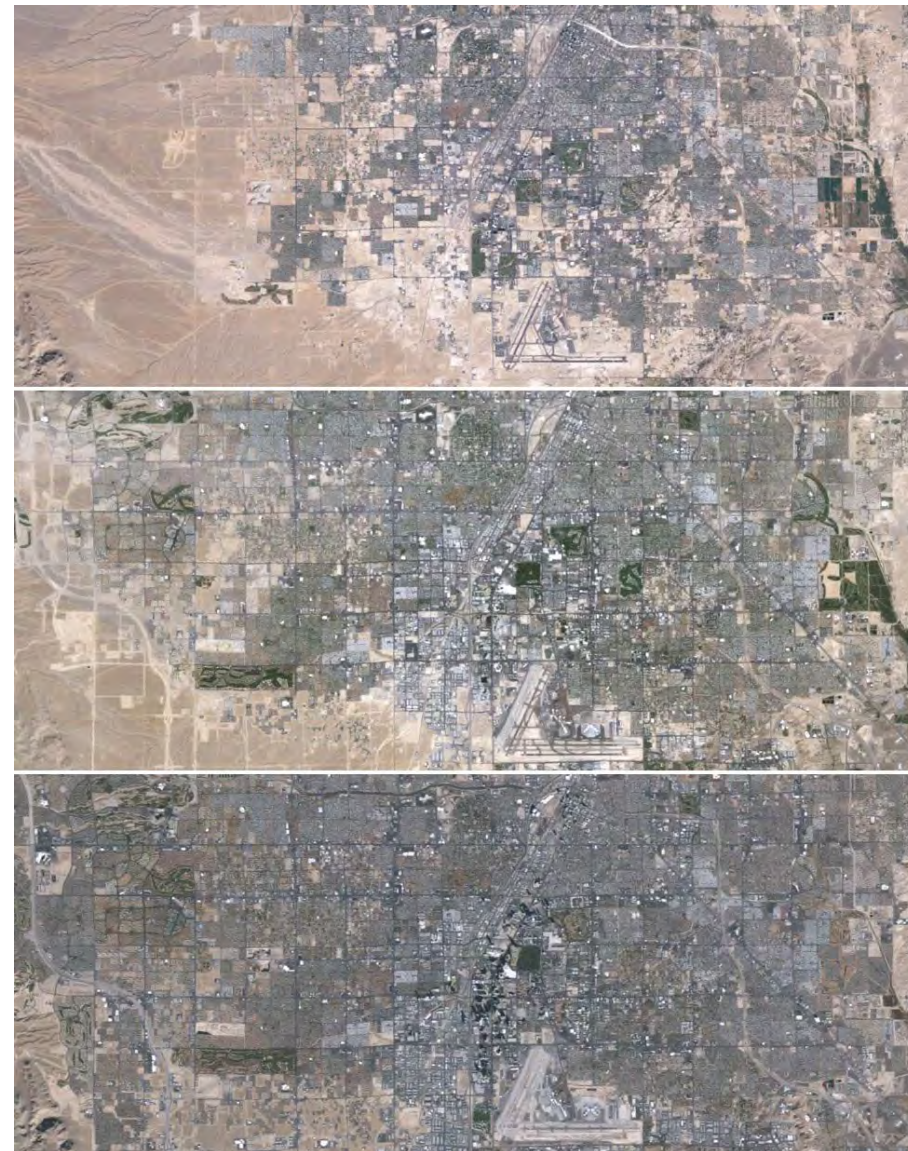
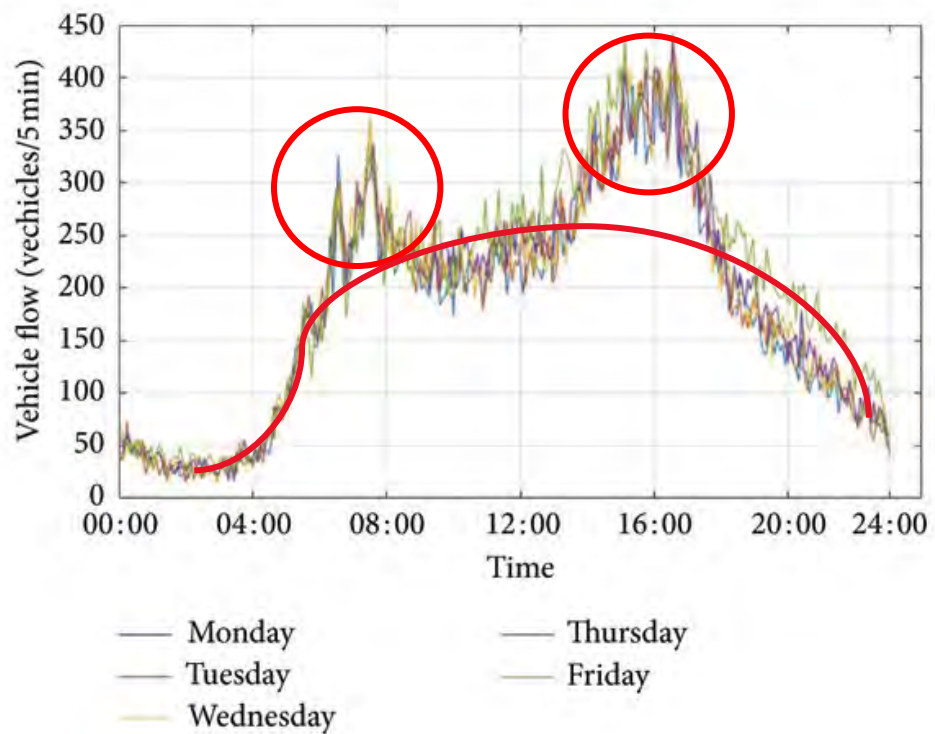
Handle large amounts of data

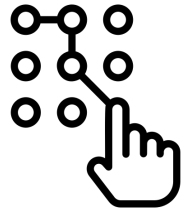


Optimization tasks



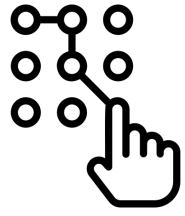
Pattern recognition



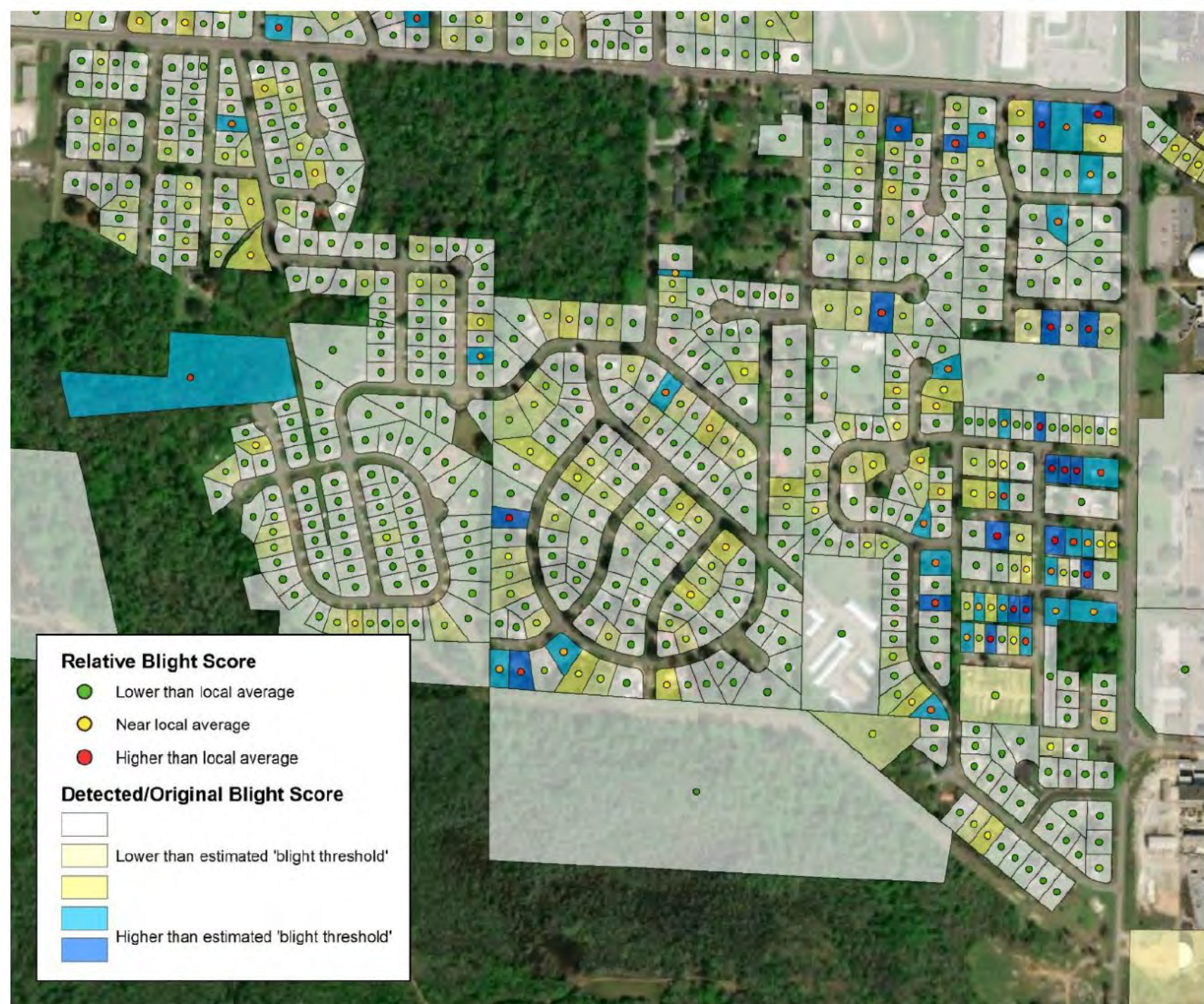


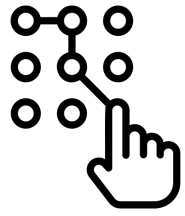
Pattern recognition



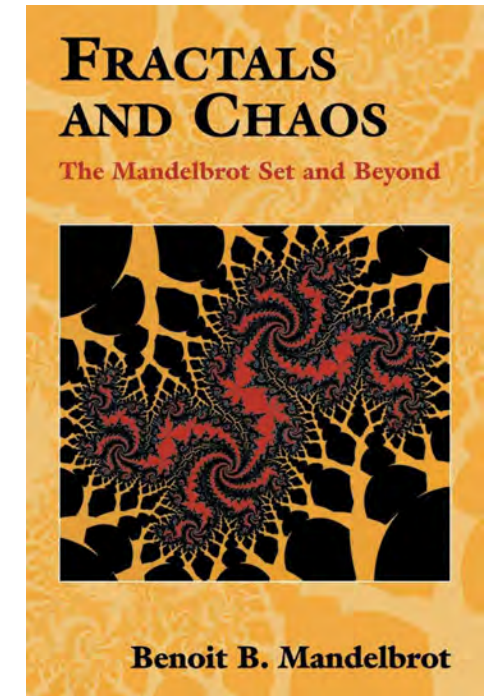
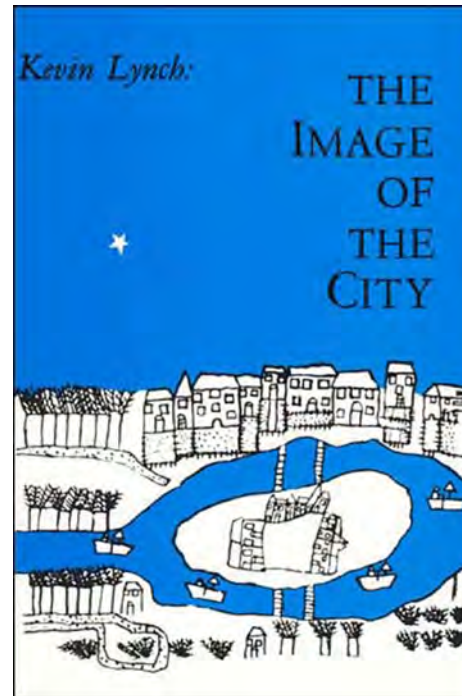


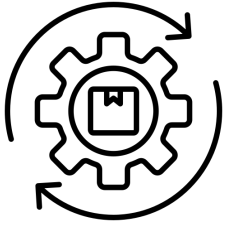
Pattern recognition





Pattern recognition





Automate
analysis tasks

Land Use and Zoning Analysis

Step 1: Data Collection and Preparation

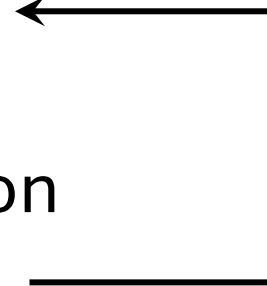
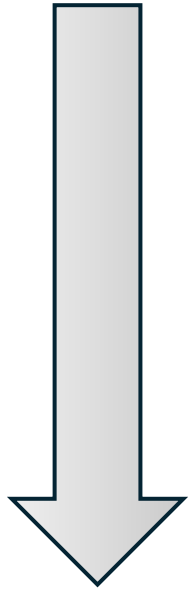
Step 2: Data Input → Model Training

Step 3: Automated Land Use Classification

Step 4: Analysis and Insight Generation

Step 5: Integration into Decision-Making

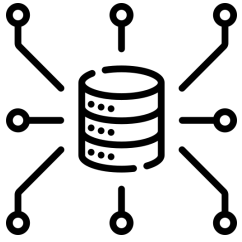
Step 6: Continuous Monitoring and Updates





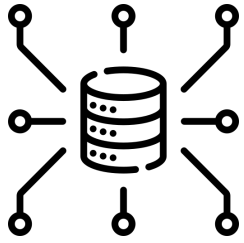
Automate analysis tasks

```
41 # Function to extract text from PDFs and track the page number
42 def extract_text_with_page_numbers(pdf_path):
43     pages_text = []
44     try:
45         with pdfplumber.open(pdf_path) as pdf:
46             for i, page in enumerate(pdf.pages):
47                 text = page.extract_text()
48                 if text:
49                     pages_text.append((i + 1, text.lower())) # Store page number and text in lowercase
50     except Exception as e:
51         print(f"Error processing {pdf_path}: {e}")
52     return pages_text
53
54 # Function to search for AI keywords in the text and return the page number and counts
55 def search_ai_techniques(pages_text, keyword_counts):
56     found_keywords = {}
57     for page_number, text in pages_text:
58         for keyword in AI_KEYWORDS:
59             if keyword in text:
60                 if keyword not in found_keywords:
61                     found_keywords[keyword] = []
62                 found_keywords[keyword].append(page_number) # Store only the page number
63                 keyword_counts[keyword] += 1 # Increment the count for each AI keyword found
64     return found_keywords
65
66 # Main function to process documents and report AI usage
67 def process_documents_for_ai(folder_path, num_docs=None):
68     ai_usage_report = []
69     keyword_counts = defaultdict(int) # To track occurrences of each AI term
70     document_ai_counts = {} # To track the total AI terms per document
71     unique_keyword_counts = {} # To track the number of unique keywords per document
72
73     # Get the list of PDF files in the folder
74     pdf_files = [f for f in os.listdir(folder_path) if f.endswith('.pdf')]
75
76     # Limit the number of documents if specified
77     if num_docs:
78         pdf_files = pdf_files[:num_docs]
```

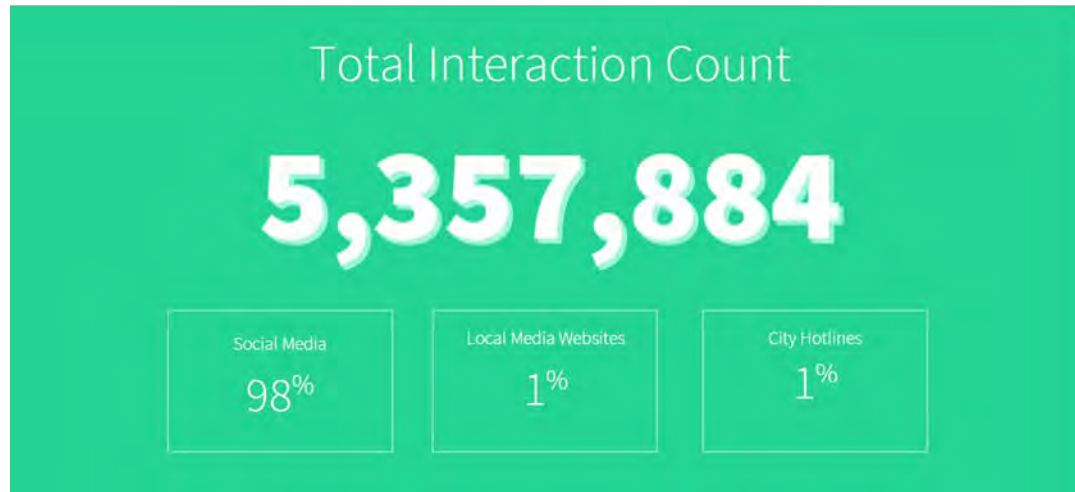


Handle large amounts of data

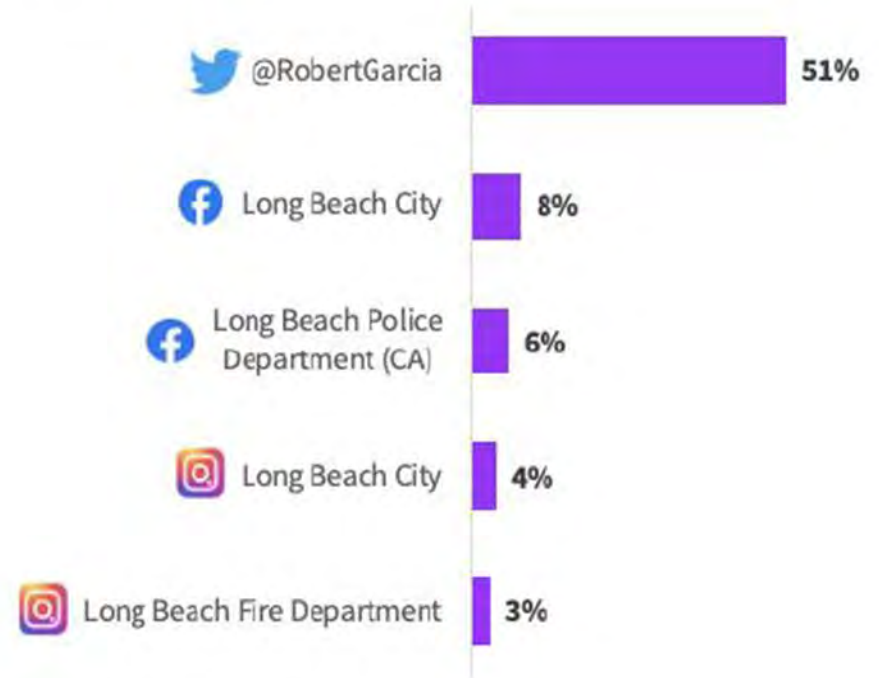


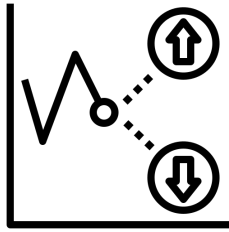


Handle large amounts of data

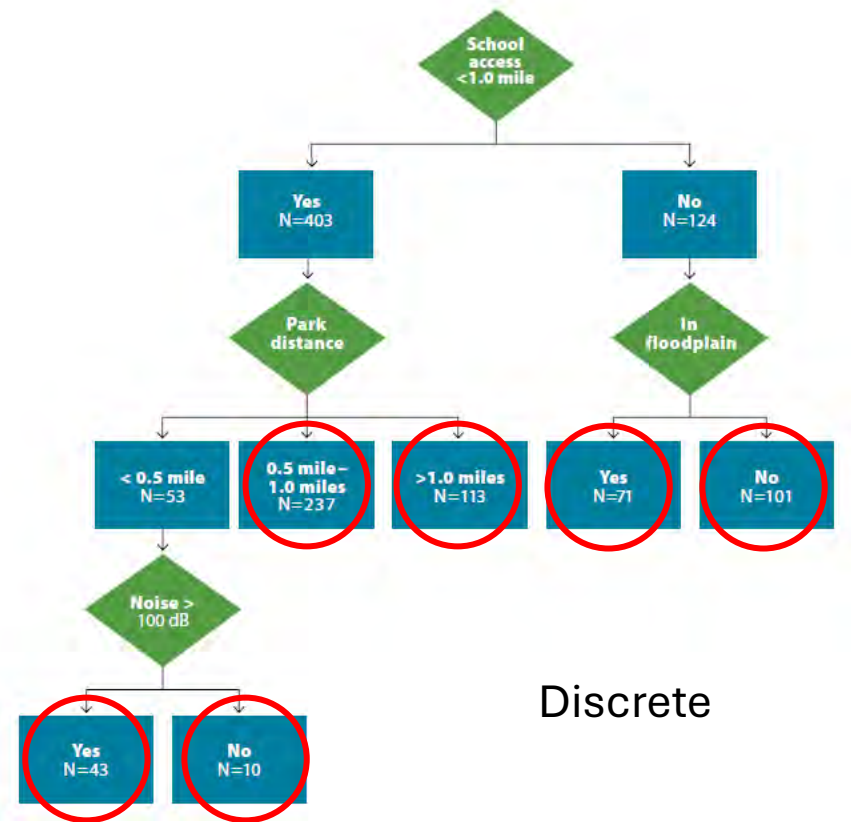
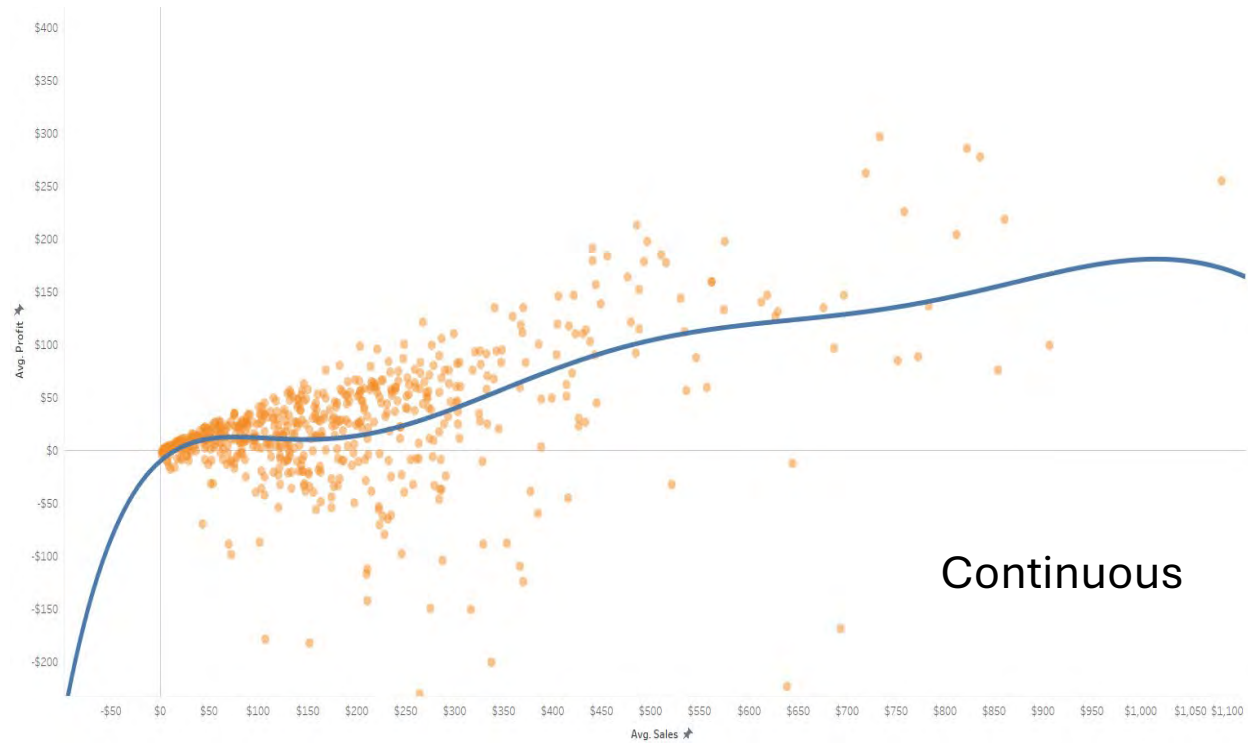


Official Channels

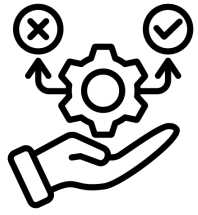




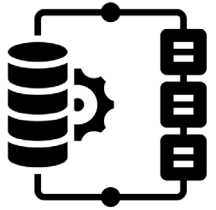
Predictive analysis



Discrete



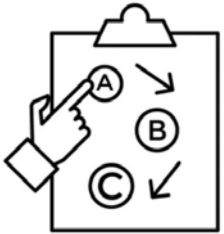
Decision
support



Data Integration



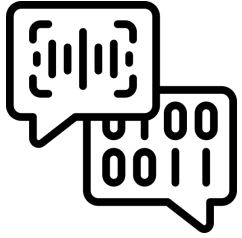
Recommendations



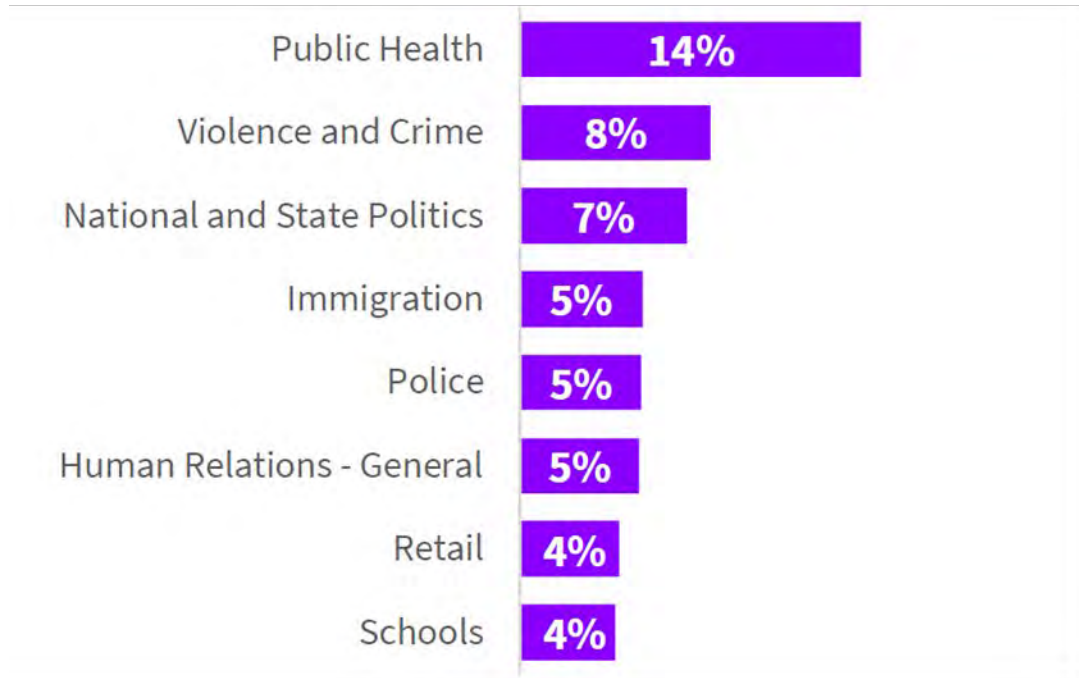
Scenario Analysis



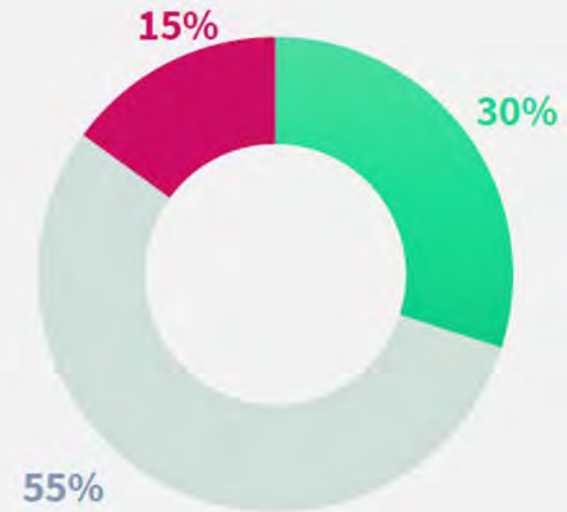
Visualization



Language processing

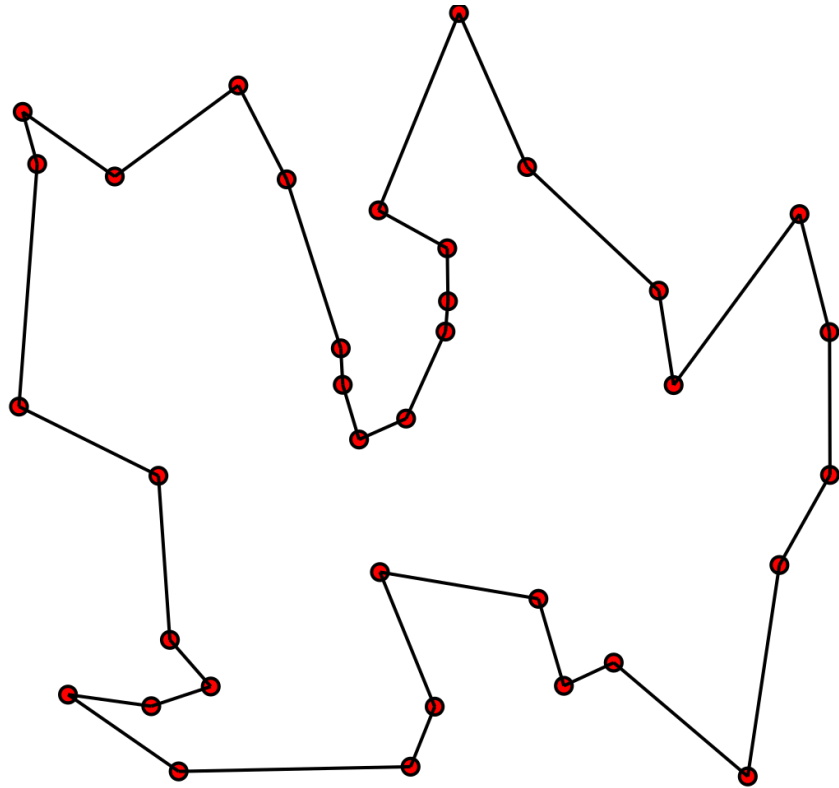


In the **overall online discourse**, positive sentiment was twice as high as negative sentiment (30% vs. 15%, respectively).

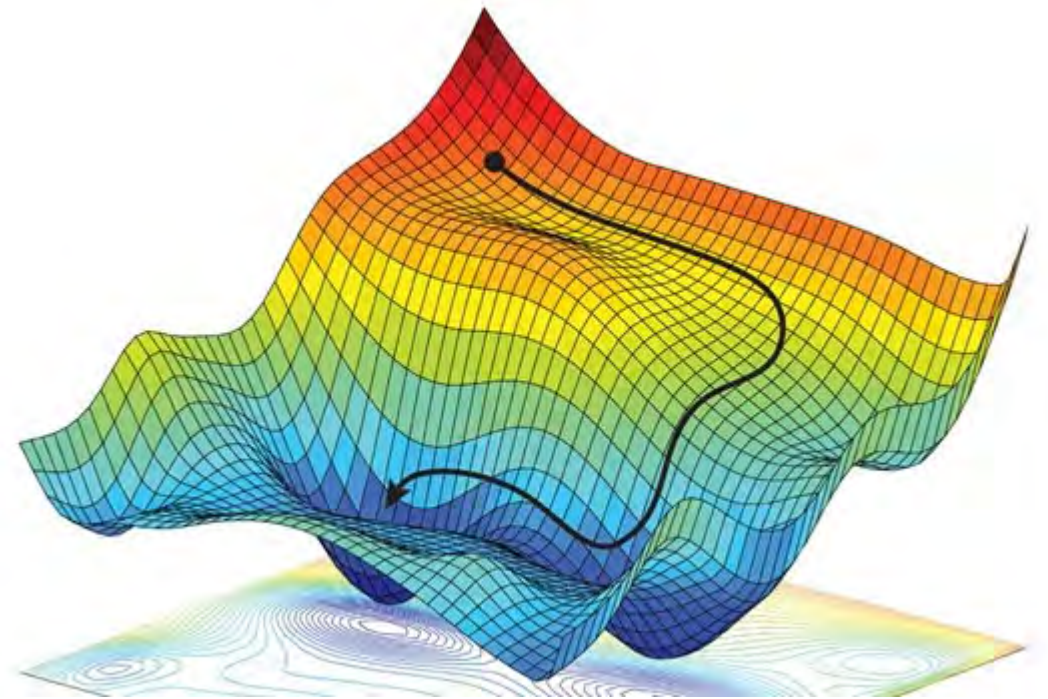




Optimization tasks



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<https://culturemachine.net/vol-20-machine-intelligences/the-mountain-in-the-machine-optimization-and-the-landscapes-of-machine-learning-sam-p-kellogg/>

Using Technology Responsibly

- Bias and fairness
- Transparency and explainability
- Privacy and data sensitivity
- Human oversight and model limitations



Sources and Types of Bias

- Data Bias
- Sampling Bias
- Algorithmic Design Bias
- Interpretation Bias



Transparency and explainability

- Public Trust
- Decision Justification
- Bias Detection
- Legal Compliance
- Error Correction



Privacy and data sensitivity

- Location Tracking
- Smart Infrastructure Data
- Surveillance Data
- Data from Social Media and Mobile Apps
- Housing and Real Estate Data
- Public Engagement and Feedback Tools
- Health and Safety Monitoring



Human oversight and model limitations

- Responsibility for Outcomes
- Responsibility for Oversight
- Transparent Decision-Making
- Ethical Standards and Guidelines
- “Human-in-the-loop”



How to get started with AI tools

- Sources for AI and planning-related information
- Sources for AI training materials





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Generative AI, Ethics, and the Future of Urban Planning NEW

Instructor: Tom Sanchez

Explore the ethical and equity implications of using generative AI in urban planning. This course addresses bias, transparency, public trust, emerging tools like digital twins, and offers practical guidance for responsible adoption.

★★★★★ 5.00

🕒 66 Mins AICP CM



Enhancing Public Participation with Generative AI NEW

Instructor: Tom Sanchez

This tutorial shows how generative AI can enhance inclusive and responsive public participation in urban planning by summarizing feedback, tailoring outreach, and visualizing scenarios using real-world tools and examples.

★★★★☆ 3.40

🕒 77 Mins AICP CM



Generative AI Tools and Workflows for Urban Planning

Instructor: Tom Sanchez

This course introduces planners to the fundamentals of Generative AI (GenAI) and



Four Reasons Urban Planners Can't Ignore AI

It's no longer a question of whether AI will shape planning, but how. That how is up to us.

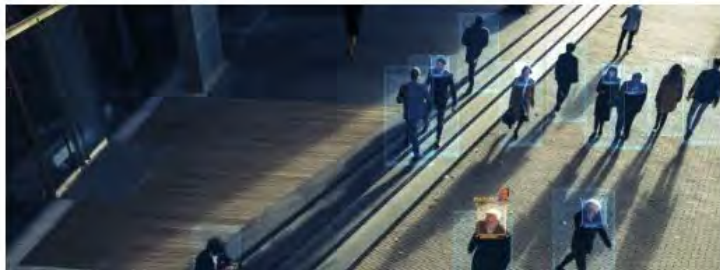
Wed, May 28, 2025 - Tom W. Sanchez



AI for Planners Explained: Urban Digital Twins

When AI stops talking and starts showing.

Thu, Jan 29, 2026 - Tom Sanchez



In Planning, the Possibilities With AI are High. So are the Stakes.




Planning history tells us that public trust is both fragile and essential. With AI, the time to set the right course is now.

Thu, Aug 28, 2025 - Tom Sanchez



Review Essay

The Ethical Concerns of Artificial Intelligence in Urban Planning

Thomas W. Sanchez  Marc Brenman  Xinyue Ye 

 OPEN ACCESS

ABSTRACT

Problem, research strategy, and findings: The integration of artificial intelligence (AI) into urban planning presents potential ethical challenges, including concerns about bias, transparency, accountability, privacy, and misinformation. As planners rely more on AI for decision making, the potential for these systems to perpetuate biases, obscure decision-making processes, and infringe on privacy becomes more pronounced, potentially undermining public trust and excluding marginalized communities. We reviewed existing literature on AI ethics in urban planning, examining biases, transparency, accountability, and privacy issues. Our methodology synthesized findings from various studies, reports, and theoretical frameworks to highlight ethical concerns in AI-driven urban planning. Recommendations for ethical AI implementation emphasize transparency, inclusive data sets, public engagement, and robust ethical guidelines. Our research identified critical ethical concerns in AI-driven urban planning. Bias in AI systems can lead to unequal outcomes, disproportionately affecting marginalized communities. Transparency issues arise from the black box nature of AI, complicating understanding and trust in AI-driven decisions. Privacy concerns are heightened due to extensive data collection and potential misuse, raising the risk of surveillance and data breaches. Limitations include the availability of specific literature focused on AI ethics for urban planning and the evolving nature of AI technologies, suggesting a need for ongoing research and adaptive strategies. Human oversight and continuous monitoring are essential to ensure ethical practices, with an emphasis on community engagement and public education to foster trust and inclusivity.

Takeaway for practice: Urban planners should adopt a proactive approach to mitigate ethical risks associated with AI. Ensuring transparency, involving diverse community groups, and maintaining robust data privacy measures are crucial. Prioritizing public engagement and education will help to demystify AI technologies and build public trust. Addressing these ethical concerns allows planners to leverage AI's potential while safeguarding equity, privacy, and accountability in urban development.

Keywords: AI, ethics, planning, technology

The machine does not isolate man from the great problems of nature but plunges him more deeply into them.

—Antoine de Saint-Exupéry

The quote by Antoine de Saint-Exupéry, a French writer and pioneering aviator best known for his novella *The Little Prince*, reflects his views on the impact of technology on human engagement with the natural world and existential issues. The statement frames the following discussion about the ethical implications of artificial intelligence (AI) in urban planning. As urban planners increasingly use AI to address complex urban challenges, they find themselves confronting not only the technological complexities of AI

but also a diverse mix of moral and ethical questions (Phillips & Jiao, 2023). This convergence of advanced technology with human-centric urban environments underscores the urgent need for a comprehensive and critical exploration of AI's influences on urban landscapes and society. This integration is fraught with ethical considerations, including privacy, equity, and accountability, which are viewed with caution and sometimes fear.

In the rapidly evolving landscape of urban technology, emerging AI tools have the potential to significantly affect urban planning and management. Considerable growth has been observed in areas like smart cities, the internet of things (IoT), and digital twins, contributing to the digitalization of urban environments. Other current cases of urban planners using

This article has been corrected with minor changes. These changes do not impact the academic content of the article. DOI: 10.1080/0944363.2024.2355305 | © 2024 The Author(s). Published with license by Taylor & Francis Group, LLC. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. The terms on which this article has been published below the journal's logo are the property of the publisher and do not constitute an offer of insurance or any other financial product.

Color version available at tandfonline.com/ijpa

THOMAS W. SANCHEZ

ARTIFICIAL INTELLIGENCE FOR URBAN PLANNING

ROUTLEDGE

Conclusions and Q&A

- Summary of key points
- Closing thoughts about aligning AI tools with planning needs
- Q&A

