



POLICY MEMORANDUM 2024-17

SUBJECT: Modernizing DC's Emergency Communications: AI-CAD Integration Framework

ARTIFICIAL INTELLIGENCE-ENABLED COMPUTER-AIDED DISPATCH

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Shooting at Howard Homecoming

(motivating example)

AlertDC, DC's official emergency alert system, did not report this incident!



Howard University Homecoming Weekend 2024

2 women, man shot blocks away from Howard University

by Khalida Volou | Sun, October 20th 2024 at 8:51 AM
Updated Sun, October 20th 2024 at 10:31 PM

ABC News [1]

Students shaken by triple shooting near Howard University as school celebrates homecoming

By David Kaplan | Updated October 21, 2024 9:58am EDT | News | FOX 5 DC | ➔

Fox News [2]



Alert Details

<<Alert list

Subject: Crime Alert 6th District (PSA 601 to 608)
Date: 10/20/2024 11:42 PM
Details: Alert: ARMED CARJACKING Investigation AT BENNING RD SE &camp; B ST SE. Lookout for 8 SUSPECTS ARMED WITH GUNS DRIVING A BLACK SCOOTER WITH A MISSING LEFT SIDE MIRROR, VA TAG J67306. DO NOT TAKE ACTION CALL 911 W/ EVENT # I20240548234
Reviewer: 5912

trainingtrack.hsema.dc.gov/NRss/RssFeed/AlertDetails/59979

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Alert Details

<<Alert list

Subject: Crime Alert 1st District (PSA 101-108)
Date: 10/21/2024 2:16 AM
Details: Alert: These are investigating an armed robbery in the Unit block of Parker Row SW. Lookout for (3-4) black males all armed with guns. One Suspect in gray hoodie armed with a long shotgun in a silver car. DO NOT TAKE ACTION CALL 911 W/ EVENT # I20240548435 1st District (PSA 101-108) Alert DC Sent by MPD Cad # 3725 Reviewer: 5912

Alert Details

<<Alert list

Subject: Crime Alert 6th District (PSA 601 to 608)
Date: 10/21/2024 2:52 AM
Details: Alert: ROBBERY Investigation in the 4000 block of MINNESOTA AVE NE. LOOKOUT FOR B/M LIGHT COMPLEXION 21YO 5'9 SLIM BUILD W/ DO NOT TAKE ACTION CALL 911 W/ EVENT # I20240548435 Sent to 6th District (PSA 601-608) Alert DC Sent by MPD Cad # 5269 Reviewer:5912

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Alert Details

<<Alert list

Subject: Crime Alert 7th District (PSA 701-708)
Date: 10/21/2024 3:29 AM
Details: Alert: Armed Robbery Investigation in the unit block of Florida Ave, NE. Lookout for 4 black males, armed with handguns in a blue 2008 Toyota Camry with Maryland tags. DO NOT TAKE ACTION CALL 911 W/ EVENT # I20240548500 Sent to 7th District (PSA 701-708) Alert DC Sent by MPD Cad # 12186 Reviewed by: 5912

Alert Details

<<Alert list

Subject: Crime Alert 5th District (PSA 501-508)
Date: 10/21/2024 3:29 AM
Details: Alert: Armed Robbery Investigation in the unit block of Florida Ave, NE. Lookout for 4 black males, wearing blue hospital mask, black clothing, all armed with guns, and last seen traveling in a silver car. DO NOT TAKE ACTION CALL 911 W/ EVENT # I20240548500 Sent to 5th District (PSA 501-508) Alert DC Sent by MPD Cad # 13246 Reviewer: 5912

trainingtrack.hsema.dc.gov/NRss/RssFeed/AlertDetails/59983

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Alert Details

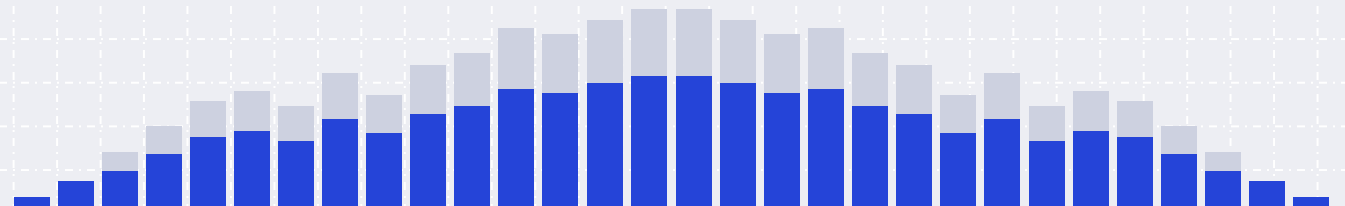
<<Alert list

Subject: Road Closures / Utility Repairs: Rock Creek Church Road, NW
Date: 10/21/2024 9:48 AM
Details: DC Water reports the 800 block of Rock Creek Church Road, NW, between Georgia Avenue and Spring Road, NW, is closed for 6-8 hours due to utility repairs. Please

No Alerts about Homecoming Shooting before articles came after reviewing their records



The purpose of this policy is to **Transform DC's Public Safety Communications** in order to:

- Fortify emergency alert infrastructure through AI integration
 - Eliminate information disparities across communities
 - Standardize incident reporting protocols
 - Enable real-time thorough multilingual emergency communications
 - Ensure constitutional compliance in public safety information dissemination
- 



Notifying Students About This Shooting in Real-Time?

01

AlertDC (relaunched in 2014)

- ❖ Users choose types of alerts to be send as SMS to their phones
- ❖ **Limited in detail**, and the 'newsworthiness' of an incident can be biased

02

DC MPD's CrimeCard System

- ❖ Provides geographical and categorical crime data **up to the previous day**
- ❖ Significant **limitations in detail and context**

03

Incident Page Network (IPN)

- ❖ IPN dispatchers monitor radio traffic to send more than **600 real-time radio messages**
- ❖ Messages are limited to "newsworthy police, fire and rescue incidents" across **United States, Canada, and Australia**
- ❖ Not openly accessible, since users must pay to subscribe





Notifying Students About This Shooting in Real-Time?



AlertDC on X

I want to explore [all violent crimes with a gun](#) over the past [1 week near me](#) within [1000 feet](#)

Please Note: Crime data will only include data up to midnight from the previous day

Offense	Location	Dates and Times
 Assault w/Dangerous Weapon (weapon: gun) CCN:24162614	2200 - 2399 Block of 8th Street NW ANC: 1E Ward: 1 PSA: 305 District: 3	Reported: 10/20/24, 5:13 AM Occurred: 10/20/24, 1:52 AM

CrimeCard for recent Howard shooting



Notifying Students About This Shooting in Real-Time?

System	Real-Time	Comprehensive	Cost
AlertDC	Yes; allegedly	No	Free
CrimeCard	No; data is up to the previous day	Yes	Free
IPN	Yes; as the incident occurs	Yes; but 600 message is low for three countries	No; must pay to subscribe



Root Causes?

01

Opaque Information Dissemination Framework

The troubling absence of standardized protocols governing the selection and distribution of public safety alerts cause **decisions to largely contingent upon subjective assessments** of "newsworthiness" or individual authorized discretion

02

Limited Personnel

With hundreds of incidents occurring every day, we can **no longer rely on solely human competence** to assess and analyze all these developments.

03

Unconscious Biases and Cognitive Shortcuts

Human bias **puts locals at risk**. As documented in behavioral science research, dispatchers, especially when consistently overwhelmed with incidents, likely introduce bias when **choosing 'newsworthy' incidents** to alert DC residents about





Recommendations

We propose a multi-stage system utilizing A.I., with various possible degrees of automation.

1) Voice Transcription

- Convert police and fire department radio traffic to text



2) Multi-Modal Summarization

- Fine-tuned generative A.I.
- Images and text can be used to more accurately summarize information
- Will utilize nationwide transition toward multimedia-enabled 911 services



3) Hypothesis-Driven Classification (DNN)

1. Generating the hypothesis or classification
2. Judging plausibility for both possible outcomes with the use of explainability metrics
3. If relevant, incorporate feedback on the evidence presented to influence the final decision



Option #1: Fully Autonomous System

A.I system has **full control** over flagging incidents and altering residents, in real-time, promptly after the incident is confirmed by first-responders.

Pros:

- Can greatly reduce the workload of dispatcher personnel allowing them to focus on other tasks

Cons:

- Great emphasis will need to be placed on explainability and validated fairness of the system
- Further research need to concretely validate thresholds of explainability and fairness to resolve liability concerns

Benefits of implementing such a system may not outweigh the costs

DNN Hypothesis-Driven Framework

1. Generate the hypothesis or classification
2. Judge plausibility for all possible outcomes with the use of explainable metrics
3. Display evidence so that dispatchers can monitor the efficacy of the system

Option #2: Semi-Autonomous System

Humans can confirm or reject the A.I.'s the system's decision. But, how much should the decision of the system influence a dispatcher's decision? Our hypothesis-driven framework is vital here.

Pros:

- Still can greatly reduce workload leading to high productivity
- Labor is divided more evenly between humans and A.I. optimizing for the skillsets of both

Cons:

- Effectiveness of the system depends on how effectively dispatchers can identify erroneous explanations and refute explanations to accept or reject a system's decision.

If chosen, dispatchers should be trained to better understand the range of responses from this system and how to validate or refute explanations from the A.I system.

DNN Hypothesis-Driven Framework

1. Generate the hypothesis or classification
2. Judge plausibility for all possible outcomes with the use of explainable metrics
3. Display evidence so that dispatchers can better decide to reject or accept the system's decision

Option #3: Human-Support System

Humans simply use the A.I. system to aid their decision making process, achieving **enhanced human capabilities**

Pros:

- Workload of dispatchers is reduced
- Most of the decision-making process is up to the dispatcher.
- Easiest version to roll-out

Cons:

- A.I. system may not being fully utilized or utilized erroneously, thus an even greater emphasis needs to be placed on training dispatchers on how to use the effectively use the system.

This is the **easiest version to roll-out**, with less ability to cause additional harms

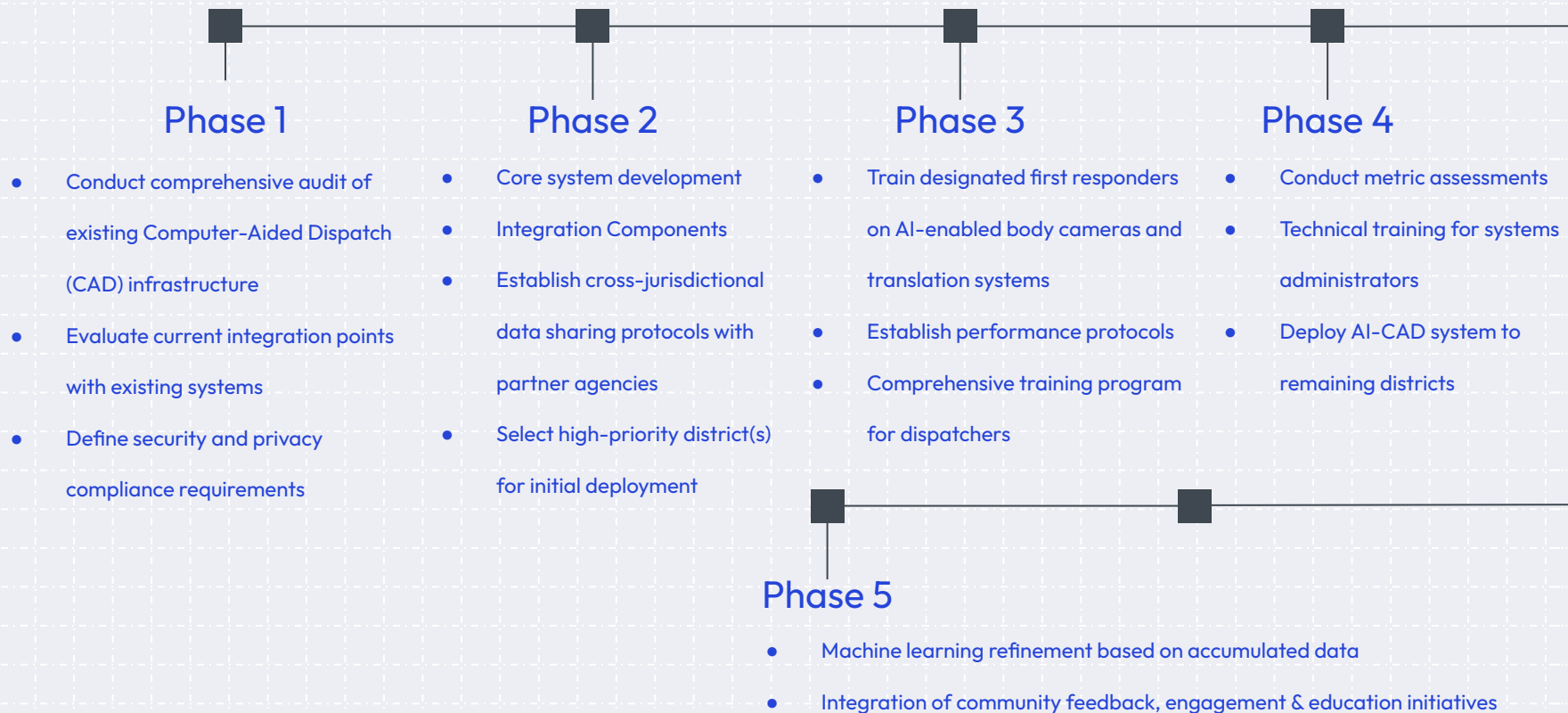
DNN Hypothesis-Driven Framework

1. The dispatcher generates their conclusion without knowing the decision by the A.I system
2. A.I system generates the hypothesis or classification
3. Judge plausibility for all possible outcomes with the use of explainable metrics
4. Display evidence so that dispatchers can utilize the explanations and decisions to ultimately make a sound decision

Options

System	Automation	Productivity Effects	Labor Impact
Fully Autonomous System	High	High	Reduced dispatcher workforce
Semi-Autonomous System	Medium	High	Hybrid workforce model requiring the skill sets of both
Human-Support System	Low	Moderate	Enhanced human capability

POLICY IMPLEMENTATION ROADMAP

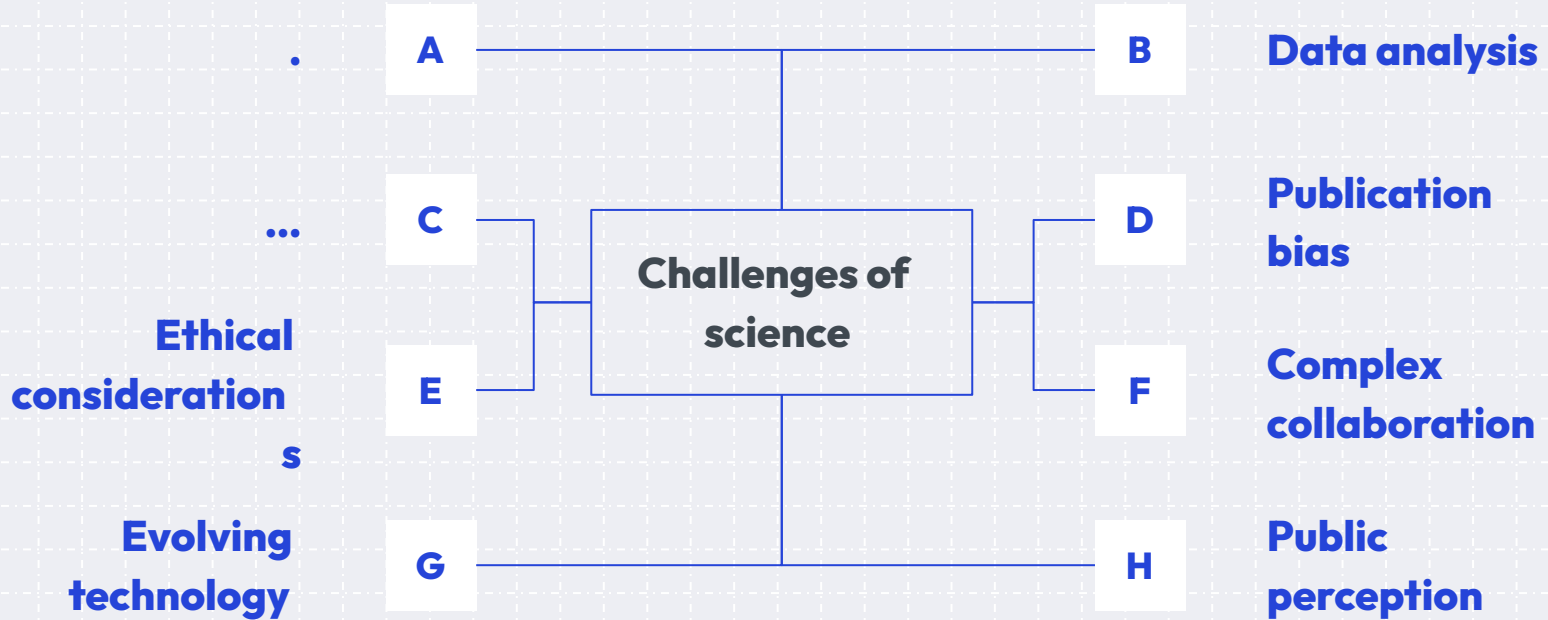




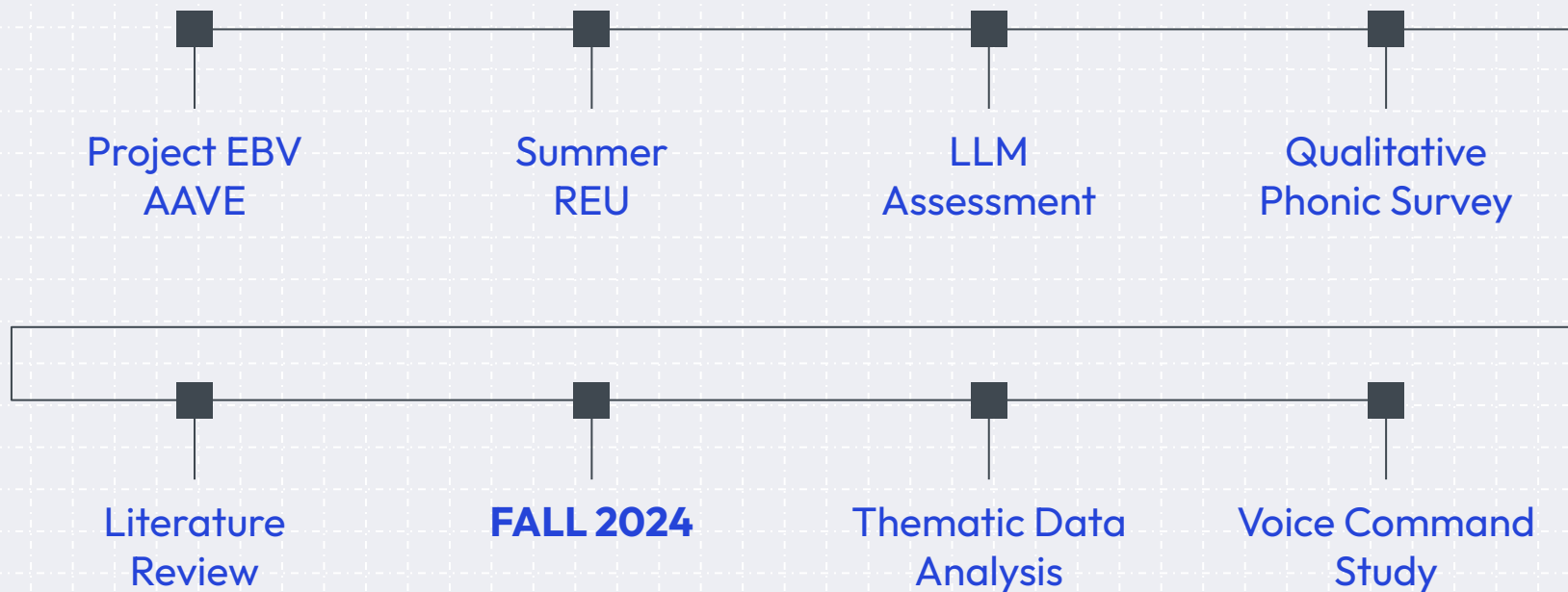
**Any
Questions!**

DATA COLLECTION

TALK TO DR. NIAS ABOUT POTENTIAL PRELIMINARY RESULTS TO INCLUDE



ROADMAP OF QUALITATIVE STUDY



LITERATURE REVIEW



We found research trends being conducted on automatic speech recognition for Children's, Hindi, Algerian, and Arabic dialect. With gaps in research centered around AAVE or African dialect(s).



PRELIMINARY ANALYSIS OF DATA

THANE ADD BIBLIOMETRICS FIGURES
ANALYZING TRENDS AND GAPS IN SLANG
RESEARCH PROJECTS

LLM DATA ANALYSIS

-
-
-

<https://docs.google.com/document/d/1bCoCGipS6sQy9Lzle0Ohd0WW9rx1hJT6y4aLG7uqXg/edit?usp=sharing>

FUTURE WORK

VOICE COMMAND STUDY

Nias



SCAN HERE

By participating in this survey your contributions will aid in the advancements of culturally component voice-enabled technologies. Thanks for your time & attention!



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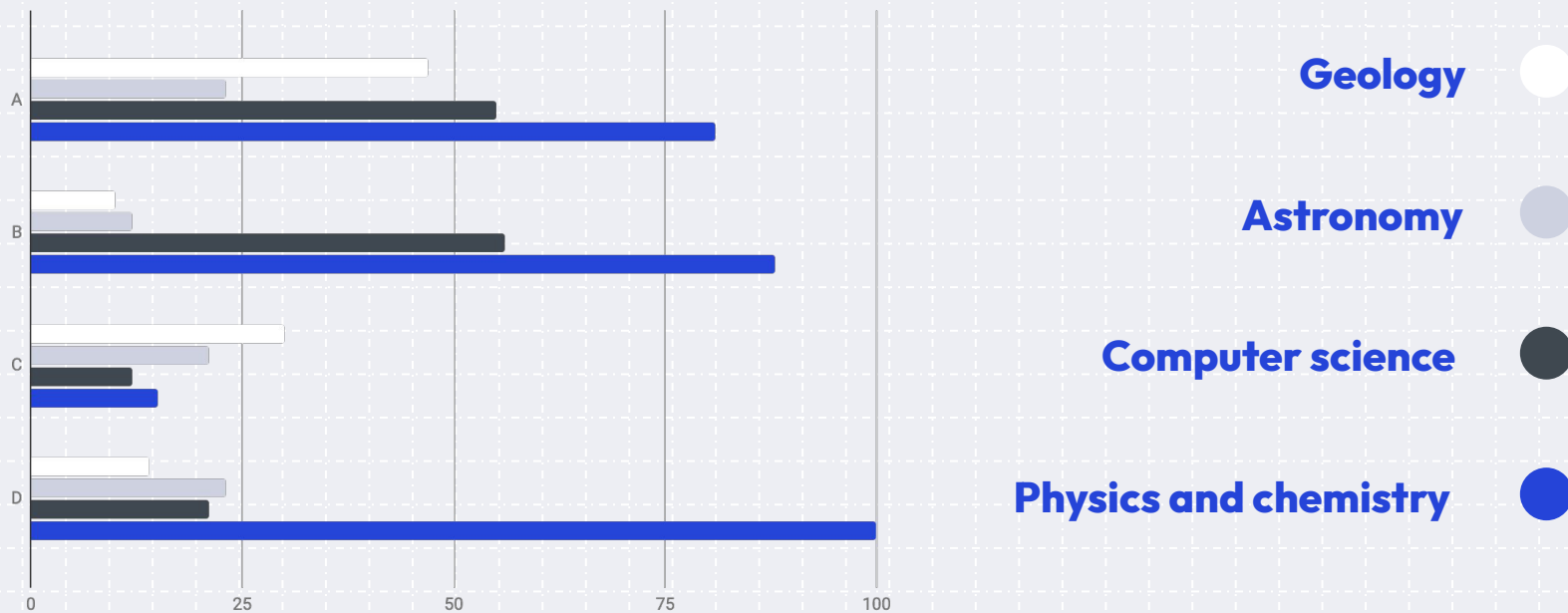
01

Scope of science

What discipline will you focus on?



Research laboratories per discipline



Follow the link in the graph to modify its data and then paste the new one here. [For more info, click here](#)



Branches of science

Physics

Learn the fundamental laws that govern the behavior of matter and energy

Biology

Comprehend the diversity of life forms and the intricate mechanisms of cells or DNA

Chemistry

Study how elements behave, or develop materials with specific properties

Astronomy

Unravel the mysteries of the cosmos, providing insights into our place in the universe

Geology

Identify valuable resources, and contribute to environmental conservation

Computer science

Create technologies that drive the digital revolution, impacting other fields





As a scientist, you will play a pivotal role in advancing human knowledge, solving complex problems, and driving innovation

Main research laboratories

USA

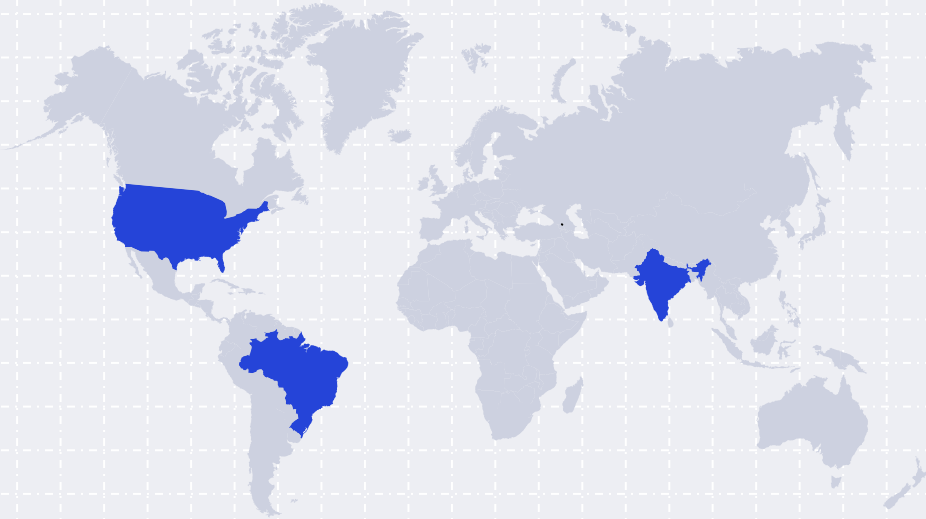
NASA's Jet Propulsion Laboratory,
National Institutes of Health

Brazil

EMBRAPA, National Synchrotron
Light Laboratory

India

ISRO, Indian Council of
Agricultural Research







Do you aspire to become a scientist?

Cultivate curiosity

Develop a strong sense of curiosity and an innate desire to explore and understand the world around you. Embrace a mindset of lifelong learning and intellectual curiosity

Embrace resilience

Science often involves setbacks and failures. Learn from these experiences, adapt, and persist in the face of challenges. Cultivate resilience, perseverance, and a growth mindset



Rubric

Criteria	Excellent (4)	Good (3)	Basic (2)	Limited (1)
Scientific method application	Thorough application; precise hypotheses	Appropriate application; clear hypotheses	Basic application; some inconsistencies	Limited application; significant gaps
Data collection and analysis	Comprehensive, accurate data; advanced tools	Accurate data; appropriate tools	Some inaccuracies; basic tools	Limited data; significant inaccuracies
Critical thinking skills	Exceptional critical thinking; integrates concepts	Effective critical thinking; logical conclusions	Basic critical thinking; limited connections	Limited critical thinking; lacks depth
Communication and presentation	Clear, persuasive communication; appropriate terminology	Clear communication; correct terminology	Some clarity; inconsistent terminology	Unclear communication; incorrect terminology

Assignment brief

Course	Science
Unit	Introduction to Scientific Inquiry
Project title	Hands-on Exploration: Scientific Method
Tutor	Dr. Tutor
Start date	MM/DD/YYYY
Deadline	MM/DD/YYYY

Abstract of the unit

This unit aims to introduce students to the fundamentals of scientific inquiry, emphasizing the scientific method as a systematic approach to investigating natural phenomena

Assignment brief

In this assignment, students will actively participate in a series of hands-on exercises designed to reinforce the principles of the scientific method. The exercises cover various scientific topics, encouraging students to formulate hypotheses, design experiments, collect data, and draw conclusions

Case study

Investigate the effects of climate change on coral reefs, focusing on a specific reef ecosystem. Explore changes in temperature, ocean acidity, and coral health to understand the broader implications of climate change on marine ecosystems

Instructions

- **Reef selection:** Choose a specific coral reef location for the case study. Consider factors such as its geographical location, biodiversity, and susceptibility to climate change
- **Data collection:** Simulate a data collection dive using virtual or real-life images of the coral reef. Collect information on water temperature, pH levels, and the health of coral species
- **Data analysis:** Collaborate with classmates to analyze the data. Identify patterns and potential correlations between climate change indicators and the condition of the coral reef
- **Adaptation strategies:** Brainstorm and discuss potential adaptation strategies to mitigate the impact of climate change on coral reefs. Consider both local and global initiatives

Conclusions

Experience

Actively seek research opportunities, such as internships, summer programs, or volunteering at laboratories or research institutions. That is key to gaining experience

Collaboration

Collaboration and teamwork are integral to scientific research, so foster strong interpersonal skills and the ability to work well with others

Being up to date

Keep up with the latest developments in your field of interest. Be open to interdisciplinary approaches and new technologies, as science is an ever-evolving discipline



Thanks!

Do you have any questions?

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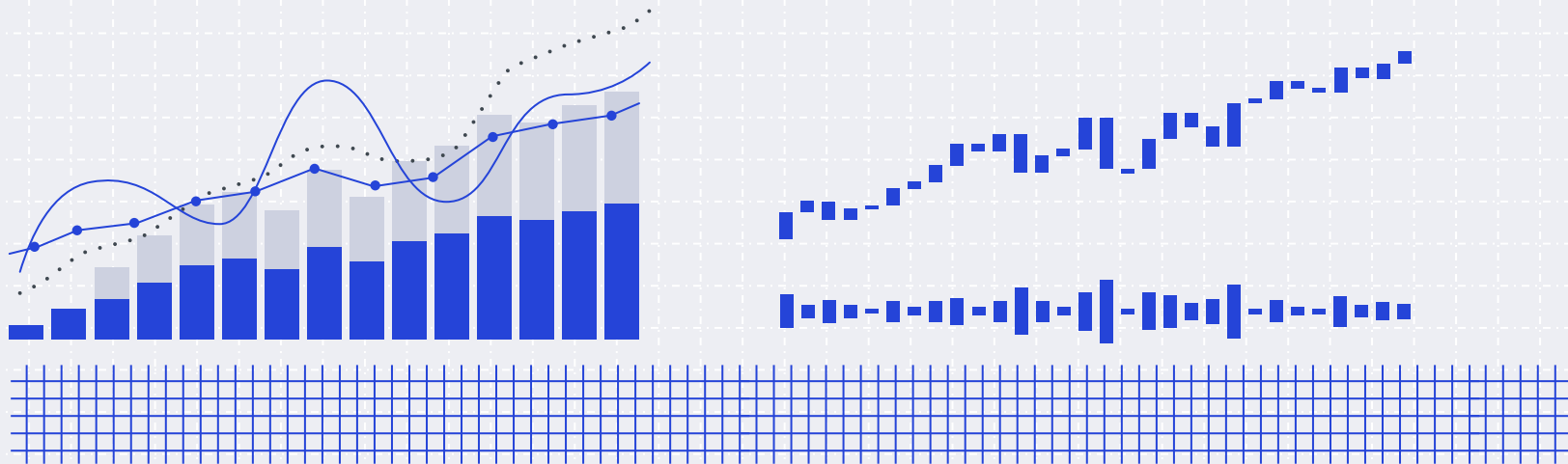
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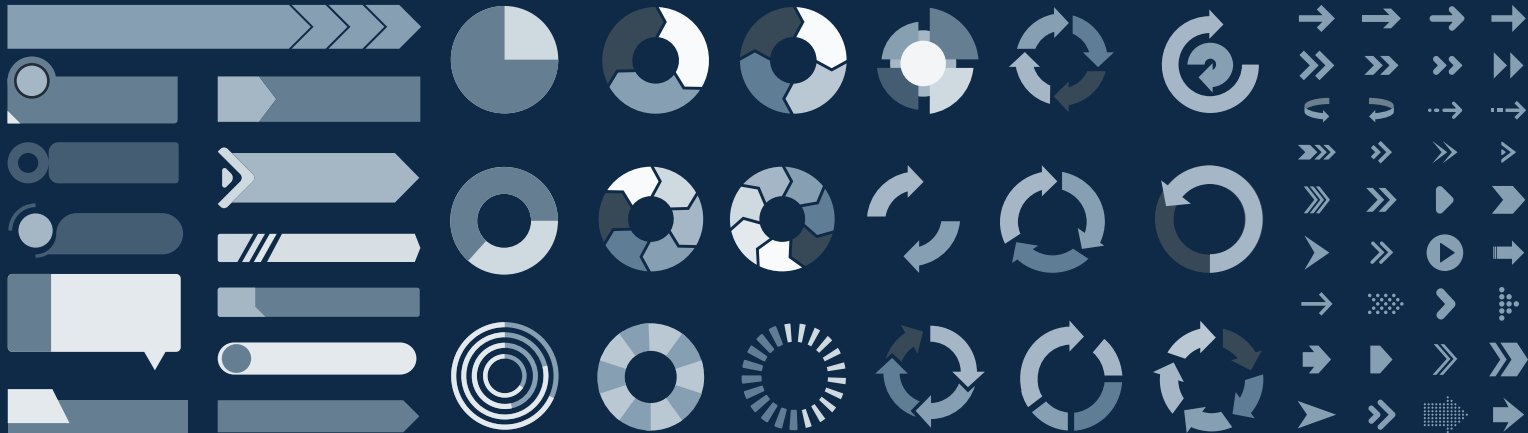
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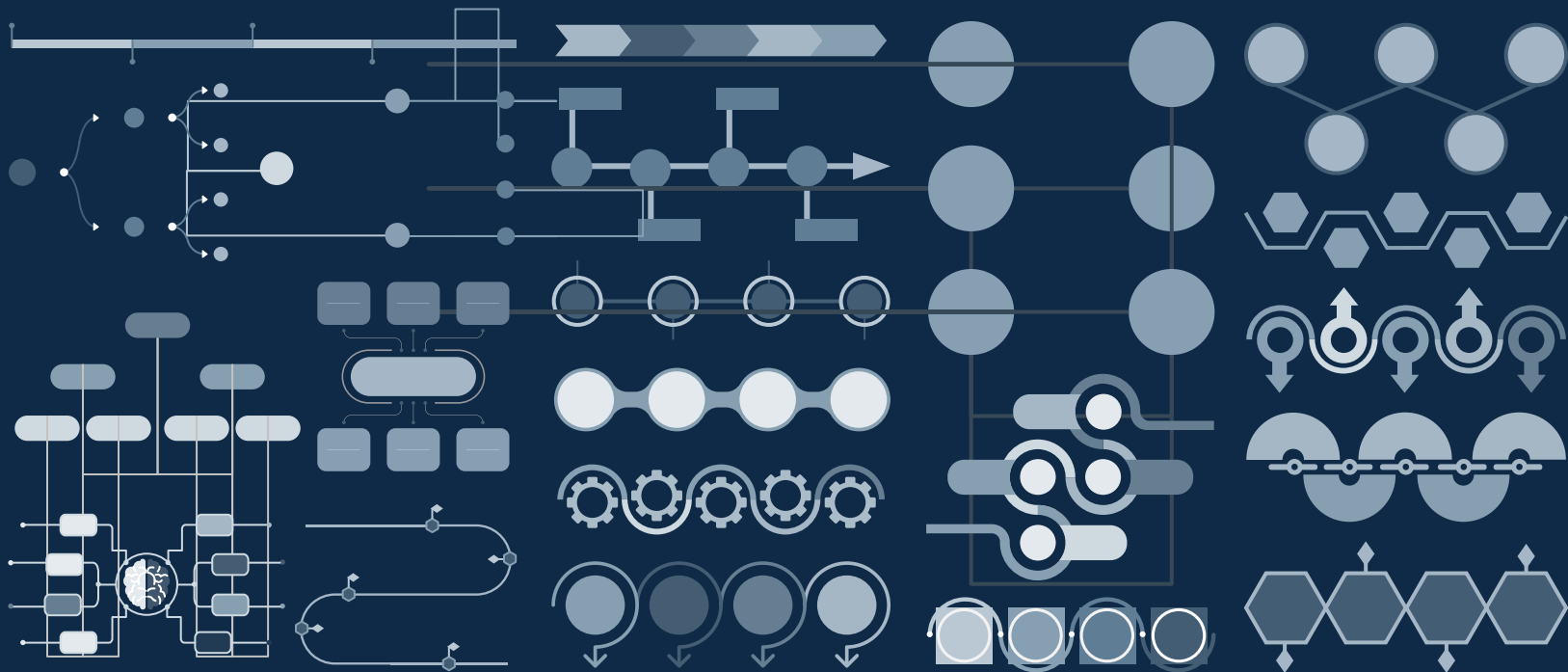
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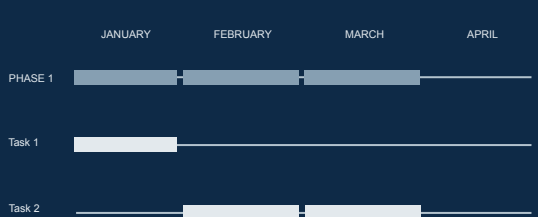
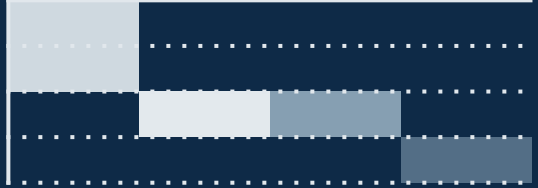
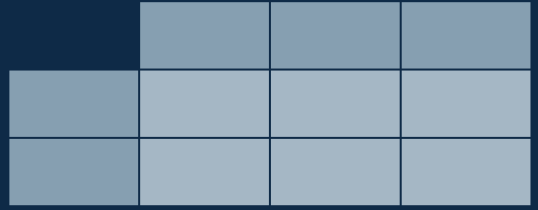
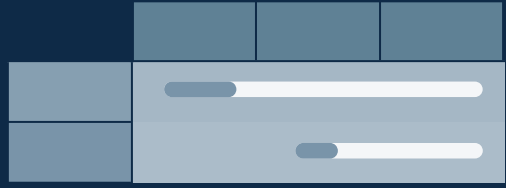
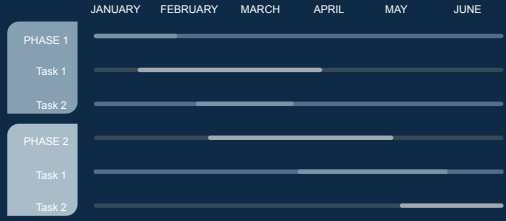
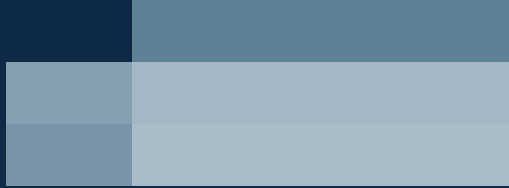
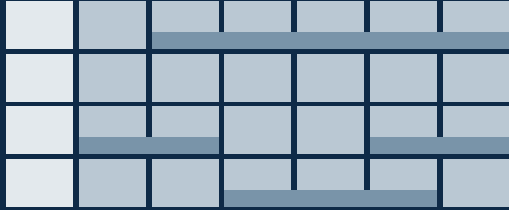
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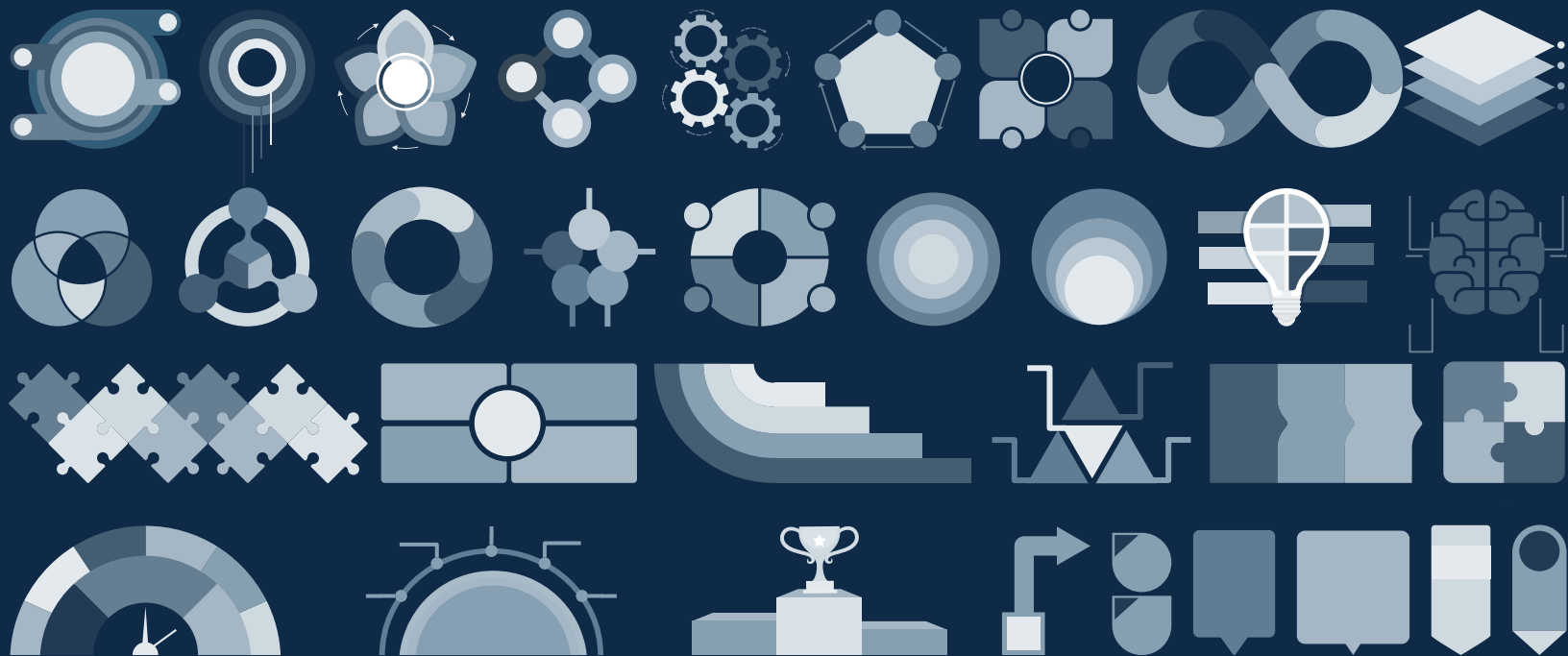
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