The background is a dark navy blue. In the top-left corner, there are two overlapping geometric shapes: a blue parallelogram and a light green parallelogram. In the bottom-left corner, there is a circular inset showing a close-up of a complex electronic circuit board with various components and traces. In the top-right corner, there is a faint, stylized graphic of a circuit board or a series of parallel lines.

Ethical Use of Autonomous vehicles in Healthcare AI



Agenda

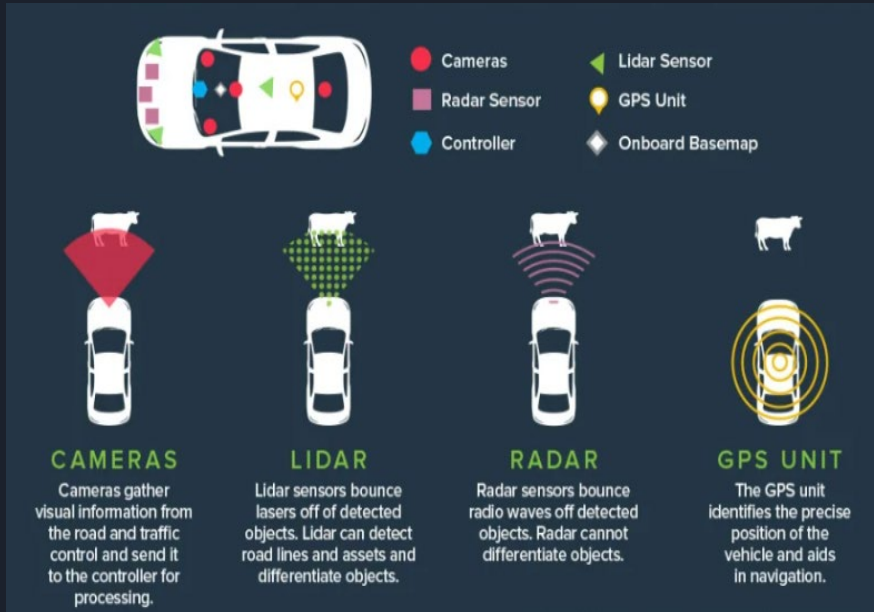
- Acknowledgment of ongoing technological advancements
- Significant Impacts
- Challenges
- Ethical Considerations

Goals

- Evolution & Significance of autonomous vehicles
- Healthcare?
- Impact

1. Autonomous vehicles - Glimpse


Combination of advanced sensors and Machine learning algorithms.



Ethical Considerations in Autonomous Vehicles

1. Decision-Making in Emergency Situations
2. Liability and Responsibility
3. Data Privacy and Security
4. Societal Impact and Accessibility

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Ethical Decision Making in Autonomous Vehicles: Challenges and Research Progress

Publisher: IEEE [Cite This](#) [PDF](#)

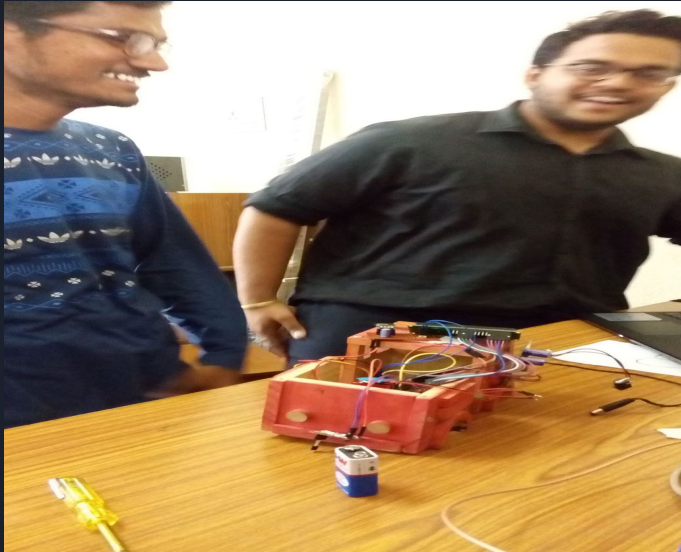
Hong Wang ; Amir Khajepour ; Dongpu Cao ; Teng Liu [All Authors](#)

22	2378
Cites in Papers	Full Text Views

Autonomous vehicle prototype

1. Accident Detection and Vehicle condition monitoring - A project based on IOT.
2. Sensors like Arduino Uno, Accelerometer, Gyroscope, etc.,.
3. Programming Language Embedded C and Python.
4. Cloud : Thingspeak





Autonomous Ambulance

1. Same prototype with additional features and sensors to make it automatic.
2. Needs vigorous testing of the source code to pass all possible test cases before finalizing.
3. Of course we do need a medical practitioner in the vehicle all the times except that its automatic.
4. Change the algorithm According to the sensors we do require.

Code base: https://github.com/arunmukkamla/Accident-Detection-and-Vehicle-Monitoring-IOT/blob/master/Main_code.ino



Code base explanation.

1. Its a portion of the code where it shows the sensors connected to the board. We can modify the code base here and make changes accordingly.
2. We can also monitor the Autonomous vehicles condition with the help of the cloud data which we'll be sending to ThingSpeak.com

```
sen1 = analogRead(A0);  
sen2 = analogRead(A1);  
sen3 = analogRead(A2);  
  
delay(3000);  
serialFlush();  
  
st:  
digitalWrite(led,LOW);  
Serial.println("ATE0");  
ret = check((char*)"OK",50);  
Serial.println("AT");  
ret = check((char*)"OK",50);
```

Vehicles Condition - Cloud Platform

ThingSpeak cloud

ThingSpeak™ Channels Apps Support - Commercial Use How to Buy

To use ThingSpeak, you must sign in with your existing MathWorks account or create a new one.

Non-commercial users may use ThingSpeak for free. Free accounts offer limits on certain functionality. Commercial users are eligible for a time-limited free evaluation. To get full access to the MATLAB analysis features on ThingSpeak, log in to ThingSpeak using the email address associated with your university or organization.

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Next

SMART CONNECTED DEVICES

DATA AGGREGATION AND ANALYTICS
ThingSpeak

MATLAB®
ALGORITHM DEVELOPMENT
SENSOR ANALYTICS

Activate Windows
Go to Settings to activate Windows.

Vehicle Condition - Key Challenge

Good Condition



Location: XYZ Street

Speed: 60 km/h

Heart Rate: 80 bpm

Oxygen Level: 98%

Patient Status: Stable

Defibrillator: Ready

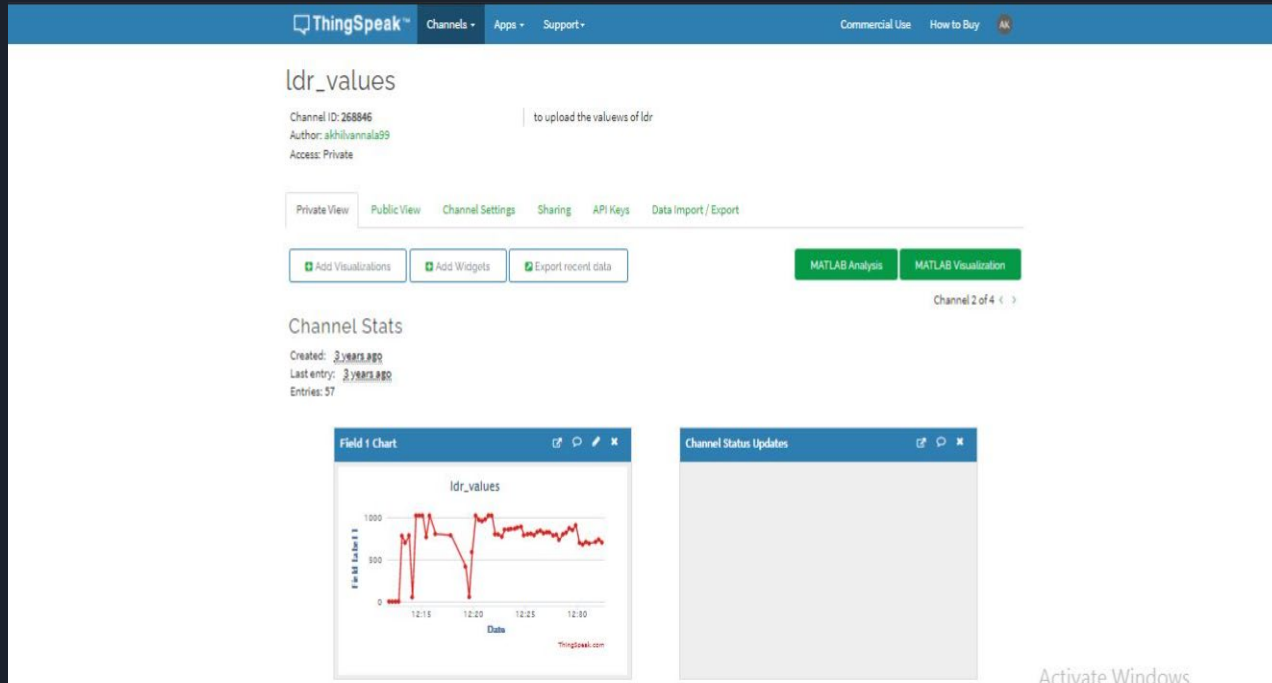
Bias Breakout: The criticality of issues, regardless of the geographic location or demographic information.

Clarity Crisis: Comprehensive but clear report highlighting critical issues.

Privacy Pursuit: Vehicle data is encrypted
→ limited to authenticated user.

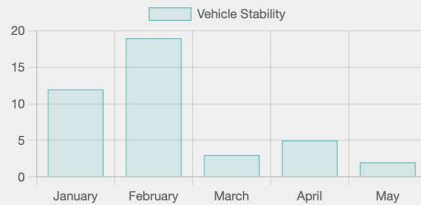
Graphs.

One sensor data: Here it is Temperature sensor data (accelerometer, gyroscope etc,..)

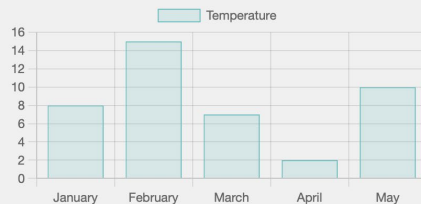


Graphs - Key Guiding Questions

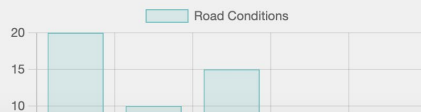
Vehicle Stability



Temperature



Road Conditions



Does it show a diverse range of scenarios?: routine and challenging conditions

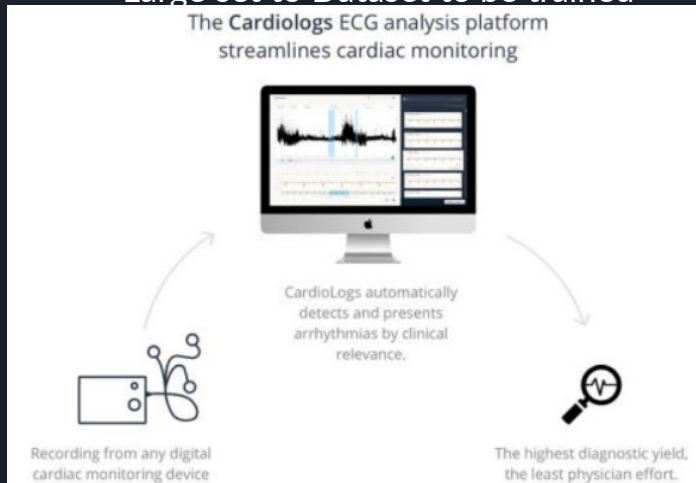
Does it cover all Categories?: weather, road complexity, and traffic density

Is it Transparent?: successful scenarios and instances requiring human intervention

What IF - EMS Equipments are integrated AI??

Cardiac Monitoring -

- Detect early cardiac abnormalities
- Oxford University - AI in Cardiology saves thousands of lives.
- Large set to Dataset to be trained



Automated External Defibrillator -

- Machine Learning models - identifies the heart rhythm
- In future - possible to give the patient condition.



What IF - EMS Equipments are integrated AI? - Contd

Glucose Monitoring Equipment -

- With AI - Better Blood Sugar Management.
- Association of Diabetes care and education Specialists - no need to bother about what they are eating



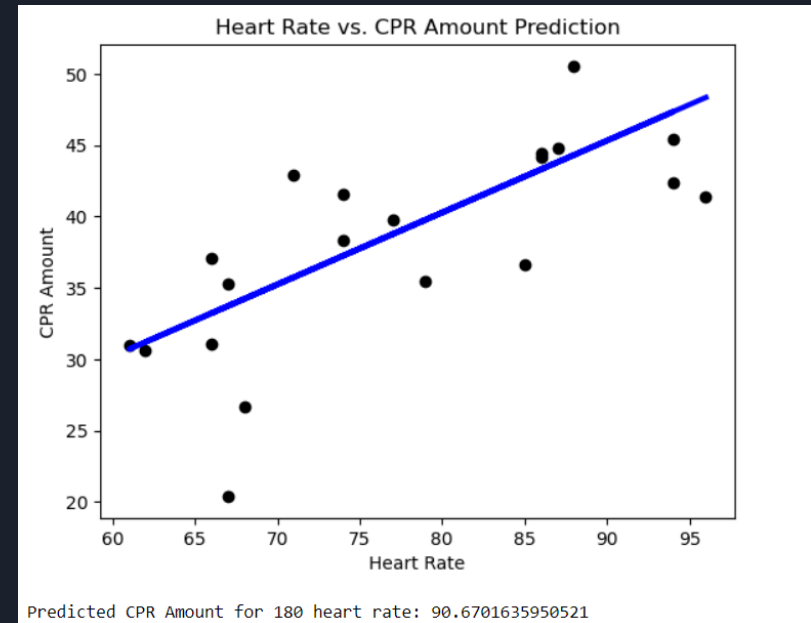
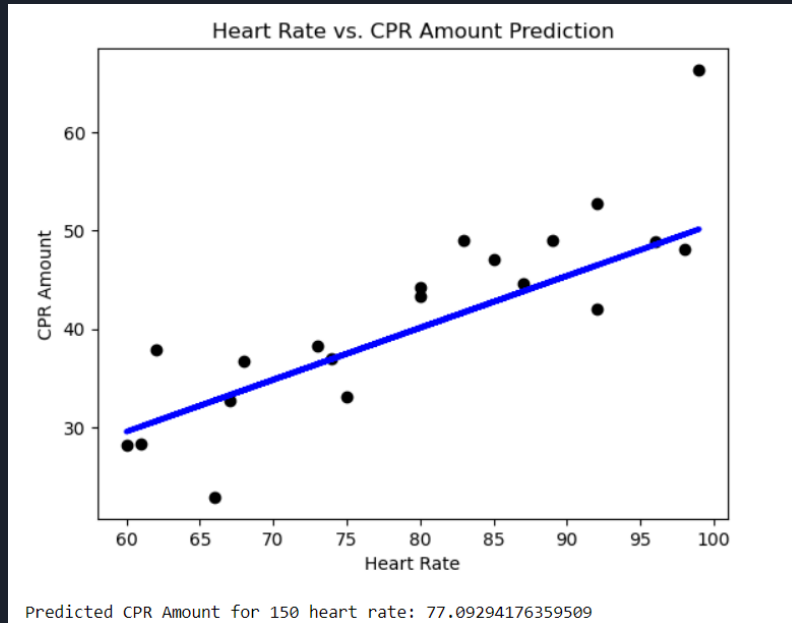
Portable Lab Equipments -

- Blood Tests lab and other Diagnostic Labs
- Doctors can get reports of patient before reaching hospital.



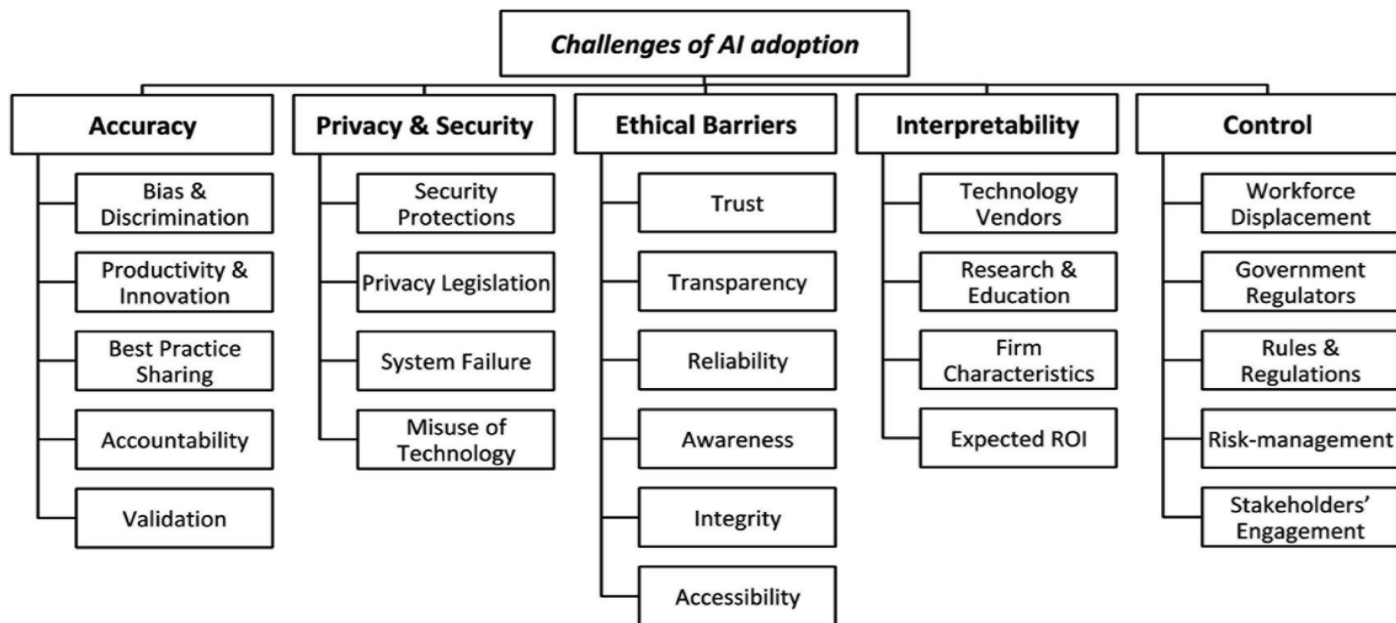
Health Care - POC

Python code - Model is simple linear regression to predict Cardiopulmonary Resuscitation (CPR) amounts based on heart rate data.



Challenges of AI adoption in Healthcare.

Prioritizing the Challenges of AI adoption in the Healthcare Sector



Crucial Advancements and Healthcare impacts of AV's :

AV's as

- Ambulance ,Trucks , Ridesharing cars, mobility pods, Mobile medical vehicles and cargo vehicles .



Direct and Indirect Impacts

- Traffic Safety
- During attack of illness
- Substance Abuse
- Road Rage or hijacks control
- Stress
- & more





Waymo -Google's investment

SoCal Lab Autonomous Air Ambulance

Richmond Marketing and Design



Ford and VW's investment in ArgoAI in 2017



Tesla self driving test



Thank you!

Any Questions ?