

# Table of Contents (Intelligent Traffic Control via IoT-based Smart Speed Bump)

1. Abstract
2. Chapter 1: Introduction (introducing smart bump system in general)
  - a. Overview
  - b. Motivation and Objectives
  - c. Methodology
  - d. Document Structure
3. Chapter 2: Literature Review
  - a. Internet of Things
    - i. Architecture
      1. Three-layer IoT architectures
      2. Five-layer IoT architectures
    - ii. Technologies (technical details as well as prices and...)
      1. Perception/Sensing Layer
        - a. Sensors (GPS and...)
        - b. Actuators
        - c. Microcontrollers (ARM, Arduino, etc.)
        - d. Software and Programming solutions
          - i. NetLab
          - ii. Scratch
          - iii. Ardublock
      2. Transportation/Network Layer
        - a. Radio-Frequency Identification (RFID)
        - b. Wi-Fi
        - c. WiMAX
        - d. Zigbee
        - e. Sigfox
        - f. Z-Wave
        - g. Long-Range Wide-Area Network (LoRaWAN)
        - h. Narrowband IoT (NB-IoT)
        - i. LTE-M
          - a. 5G
          - b. The client/server architecture protocols
      3. Middleware/Processing Layer
        - a. Microsoft Azure IoT
        - b. Amazon AWS
        - c. Google Cloud
        - d. Open Source Platforms
      4. Application Layer
      5. Business Layer
    - b. Multi-level Data Architecture
      - i. Level 1: Data collection
      - ii. Level 2: Data processing
      - iii. Level 3: Data integration and reasoning
      - iv. Level 4: Device control and alerts
    - c. Applications of the Internet of Things
      - i. Smart Homes
      - ii. Environmental Conditions Monitoring
      - iii. Logistics and Supply Chain Management
      - iv. Security and Surveillance Systems
      - v. Industrial condition monitoring
        1. Smart Energy
        2. Smart Factory

- vi. Health-care assistance
- vii. Smart city
- viii. Smart Transportation
  - 1. Smart parking system
  - 2. Smart sign board system
  - 3. Smart roads
- ix. Real-world examples (which can be omitted if discussed at the end of each application)

d. Market trends and dominant players

4. Chapter 3: Smart Bump: A Case Study Implementation

- a. Introduction (Motivation, Comparison with mechanical methods)
- b. Methodologies and Frameworks
  - i. Used Hardware
  - ii. Used Software
  - iii. Data Acquisition Methods
  - iv. Code reviews (snippet by snippet in details and with enough references to diagrams and formulas)

5. Chapter 4: Performance Evaluation

- a. Comparison of the situation before and after implementation
- b. Comparison of alternative approaches in terms of expenses
- c. Market analysis for this project
  - i. Manual Usage in critical situations
  - ii. Stakeholders (Police, Emergency, Traffic,...)

6. Chapter 5: Conclusion

- a. Results and Discussions
- b. Open Challenges
- c. Future Prospects

7. References