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ML23-06 Magic Wand with an Arduino Nano 33 BLE sense

Literature Review

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5. November 2024

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57 References

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Introduction

This project uses the Arduino Nano BLE33 Sense hardware in conjunction with TinyML to build a Magic Wand that can recognise hand motions. An AI model on the Arduino is activated by waving the wand, interpreting gestures and displaying visual feedback. In a clear and interesting way, this project demonstrates the combination of hardware and AI for gesture recognition.

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Literature Review Article: 1

A Comprehensive Survey on TinyML I

Description:
This paper conducts a literature survey on TinyML, a field focusing on low-profile devices and applications for machine learning in resource-constrained environments. It explores TinyML techniques and their applications in areas like healthcare, smart farming, environment, and anomaly detection, highlighting challenges and suggesting future research directions.Abadade u. a., 2023

Keywords:
TinyML, embedded machine learning, deep learning, edge intelligence.

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Literature Review Article: 2

Reviews on Various Inertial Measurement Unit (IMU) Sensor Applications I

Description:
This paper reviews Inertial Measurement Unit (IMU) sensors, highlighting their diverse applications in manufacturing, navigation, and robotics. It summarizes considerations for selecting IMUs based on specific applications, discusses methods to enhance accuracy, including control algorithms and sensor filters, and explores the pros and cons of various IMU types and algorithms across different contexts. Keywords: IMU, sensors, applications, control algorithms, accuracy improvement. Ahmad u. a., 2013

Keywords:
IMU, inertial sensors, sensor applications, navigation, robotics, control algorithms, accuracy improvement.

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Literature Review Article: 3

A Study on New Arduino Nano Board for WSN and IoT Applications I

Description:
This paper introduces new Arduino Nano boards released in summer 2019, highlighting enhanced specifications at a lower cost. The boards feature wireless communication (Wi-Fi and Bluetooth) and include general-purpose sensors for temperature, humidity, pressure, and acceleration. The study concludes that these boards will enhance IoT project design and wireless sensor networks. Al-Mimi u. a., 2020

Keywords:
Arduino Nano, IoT application, BLE (Bluetooth Low Energy), Single board controller.

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Literature Review Article: 4

Description: Accessing Accelerometer Data on Nano 33 BLE Sense Arduino Documentation
This Arduino tutorial provides guidance on using the Inertial Measurement Unit (IMU) accelerometer feature in the Nano 33 BLE Sense board. It covers IMU basics, accelerometer configuration, and example code to read accelerometer data. Alushi, o. D.
Keywords:
Arduino Nano 33 BLE Sense, tutorial, IMU accelerometer, sensor data, code examples.

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Literature Review Article: 5

Real-Time Operating Systems for Small Microcontrollers I

Description:
This article explores the distinctions between real-time operating systems (RTOSs) and generic operating systems, evaluating the advantages and disadvantages of employing RTOSs in small microcontroller system development. Benchmarking results for four RTOSs are presented, showcasing their performance across various criteria. Anh und Tan, 2009-09
Keywords:
Real-time operating systems, microcontroller systems, embedded systems, RTOS benchmarks.

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Literature Review Article: 6

Arduino Datasheet I

Description:
The Arduino Guide provides an introduction to Arduino, a popular open-source electronics platform. It covers the basics of Arduino, hardware components, and programming, offering a beginner-friendly guide to kickstart projects. Arduino 2019, 2019

Keywords:
Arduino, open-source electronics, hardware, programming, beginner's guide

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Literature Review Article: 7

Arduino Nano 33 BLE Sense Arduino Documentation I

Description:
This documentation covers hardware specifications, pin configurations, and programming guidelines, making it a valuable resource for developers and hobbyists. With a focus on the unique features of the Nano 33 BLE Sense, including its integrated sensors and Bluetooth Low Energy capabilities, the documentation facilitates efficient and effective development for various IoT and sensor-based projects. Arduino, 2021

Keywords:
Arduino Nano 33 BLE Sense, documentation, hardware specifications, integrated sensors, Bluetooth Low Energy, IoT projects.

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Literature Review Article: 8

Arduino Nano 33 BLE Sense I

Description:
The Arduino Nano 33 BLE Sense documentation offers comprehensive information about the hardware specifications, features, and usage guidelines for the Arduino Nano 33 BLE Sense board, a compact and versatile development platform. Arduino, 2023

Keywords:
Arduino Nano 33 BLE Sense, hardware documentation, development platform, specifications, features.

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Literature Review Article: 9

APDS-9960 Digital Proximity, Ambient Light, RGB and Gesture Sensor I

Description:
The APDS-9960 Digital Proximity, Ambient Light, RGB, and Gesture Sensor is featured in the Avago Technologies journal. This sensor integrates digital proximity, ambient light, RGB color sensing, and gesture recognition capabilities, making it versatile for applications ranging from ambient light adjustments to gesture-controlled interactions. The journal likely provides in-depth insights into the sensor's specifications, applications, and performance within various contexts.
Avago Technologies, 2015

Keywords:
APDS-9960, Digital Sensor, Proximity, Ambient Light, RGB, Gesture Recognition, Avago Technologies.

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Literature Review Article: 10

What is edge computing? Everything you need to know I

Description:
Edge computing refers to the decentralized processing of data near the source of data generation, reducing latency and enhancing real-time processing capabilities. Bigelow, Stephen J., 2021

Keywords:
Edge computing, decentralized processing, data generation, reduced latency, real-time processing.

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Literature Review Article: 11

Connecting Nano 33 BLE Devices over Bluetooth® | Arduino Documentation I

Description:
Arduino's tutorial guides users on establishing Bluetooth Low Energy (BLE) communication between two Arduino Nano 33 BLE Sense devices. The tutorial covers essential steps for setting up BLE connections, facilitating device-to-device communication, and leveraging the capabilities of Nano 33 BLE Sense for BLE applications. It serves as a practical resource for Arduino enthusiasts exploring wireless communication solutions. Bagur, o. D.

Keywords:
Arduino, tutorial, Bluetooth Low Energy, BLE, communication, Nano 33 BLE Sense.

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Literature Review Article: 12

AI Magic Wand with TensorFlow Lite for Microcontrollers I

Description:
This CodeLab is likely a hands-on tutorial or workshop designed to guide developers through the process of building or exploring a project related to a Magic Wand.It could involve various technologies or frameworks, and the CodeLab likely provides step-by-step instructions, code snippets, and resources for developers to learn and experiment with this particular project.*AI Magic Wand with TensorFlow Lite for Microcontrollers and Arduino | Google Codelabs* o. D.

Keywords:
Google Developers, CodeLab, Magic Wand, Hands-on Tutorial.

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Literature Review Article: 13

Sending Data between two Nano 33 BLE Senses to make a magic wand I

Description:
The discussion appears to revolve around the topic of sending data between two Arduino Nano 33 BLE Sense boards with the goal of creating a Magic Wand.Participants in the forum likely share insights, code snippets, and troubleshooting tips related to this specific project. It serves as a valuable resource for those looking to engage in collaborative discussions and seek assistance with the development of their magic wand project. *Sending Data between two Nano 33 BLE Senses to make a magic wand* 2021

Keywords:
Arduino Forum, Nano 33 BLE Sense, Data Communication, Magic Wand Project.

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Literature Review Article: 14

Topic 3: TensorFlow Lite Micro: Embedded Machine Learning on TinyML Systems I

Description:
TensorFlow Lite Micro (TFLM) represents a groundbreaking advancement in the field of machine learning, specifically tailored for the unique challenges posed by embedded systems and TinyML applications [David u. a., 2021]. The paper explain about deep-learning models on embedded systems. But, it has lack of unified TinyML framework for embedded systems and custom frameworks require manual optimization for each hardware platform.

Keywords:
TinyML, Embedded Machine Learning, TensorFlow Lite Micro, Neural Networks, Resource Constraints, resource constraints and cross-platform interoperability challenges.

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Literature Review Article: 15

MEMS and FOG Technologies for Tactical and Navigation Grade Inertial Sensors I

Description:
This paper provides an industry perspective on inertial sensors for navigation, focusing on MEMS (Microelectromechanical System) accelerometers, MEMS gyroscopes, and Fiber Optic Gyroscopes.The paper offers a comparison of these technologies, addressing their pros and cons, aiming to guide system engineers in selecting the most suitable option for various navigation applications.Deppe u. a., 2017
Keywords:
MEMS accelerometer; MEMS gyroscope; coriolis vibratory gyroscope; fiber optic gyroscope; multifunction integrated optics chip; angle random walk.

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Literature Review Article:16

Why do We Use the Arduino Programming Language? How is it Helpful? I

Description:
This blog post from Emeritus provides insights into coding with the Arduino programming language. It covers fundamental concepts and practices for programming Arduino boards, making it a valuable resource for beginners and enthusiasts interested in exploring the capabilities of Arduino through coding. Emeritus, o. D.

Keywords:
Arduino programming language, coding, Arduino boards, programming concepts, Emeritus blog.

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Literature Review Article: 17

The KDD process for extracting useful knowledge from volumes of data I

Description:
Short Description: The Knowledge Discovery in Databases (KDD) process is detailed by Fayyad, Piatetsky-Shapiro, and Smyth, outlining the systematic steps for extracting valuable knowledge from extensive datasets. Fayyad, Piatetsky-Shapiro und Smyth, 1996
Keywords:
KDD process, data mining, knowledge discovery, data analysis.

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Literature Review Article: 18

Integrated development environment “IDE” for Arduino I

Description:
The paper introduces an Integrated Development Environment (IDE) designed for Arduino, a popular open-source electronics platform. Developed by Mohamed Fezari and Ali Al Dahoud at Al Zaytoona University in Amman, Jordan, this IDE aims to enhance the Arduino programming experience, providing a user-friendly interface for writing, compiling, and uploading code to Arduino boards. The authors detail the features and functionalities of their IDE, offering insights into its design and potential benefits for Arduino developers. Fezari und Al Dahoud, 2018

Keywords:
Integrated Development Environment (IDE), Arduino, open-source electronics, programming, software development, Al Zaytoona University, Amman, Jordan.

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Literature Review Article: 19

A tour of tensorflow I

Description:
This paper explores TensorFlow, Google's open-source deep learning library, and its impact on computer vision, speech recognition, and natural language processing. Comparing TensorFlow to alternatives like Theano and Torch, the study highlights its computational paradigms and distributed execution model. The observed use-cases in academia and industry underscore TensorFlow's significance in modern deep learning.Goldsborough, 2016
Keywords:
Deep Learning, TensorFlow, Artificial Intelligence, Machine Learning, Neural Networks, Distributed Computing, Open Source Software

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Literature Review Article: 20

Recent Advances in Convolutional Neural Networks I

Description:
Deep learning, particularly CNNs, excels in visual and speech recognition. This paper surveys recent CNN advancements, emphasizing layer design, activation functions, loss functions, regularization, optimization, and fast computation. Applications span computer vision, speech, and natural language processing. Gu u. a., 2018

Keywords:
Convolutional neural network Deep learning

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Literature Review Article: 21

Edge-Computing Architectures for Internet of Things Applications: A Surve I

Description:
This paper reviews Edge-Cloud-Computing Architectures for IoT (ECAs-IoT), categorizing them by data, security, and big data aspects. It analyzes, compares, and recommends improvements, highlighting IoT applications and suggesting practical scenarios for ECAs-IoT use.Hamdan, Ayyash und Almajali, 2020

Keywords:
Internet of Things (IoT), Cloud Computing, Edge Computing, Edge-Cloud-Computing Architectures, Data Placement, Orchestration Services, Security, Big Data, IoT Layered Models, Applications, Latency, Resource Limitations

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Literature Review Article: 22

Edge Computing Overview I

Description:
Hazelcast likely provides concise and informative content about Edge Computing, covering key concepts, definitions, and applications. This resource is valuable for those seeking to understand the fundamental aspects of Edge Computing within the context of distributed systems and data processing. *Edge Computing Overview: IoT Processing at the Edge | Hazelcast* 2023

Keywords:
Hazelcast, Glossary, Edge Computing, Distributed Systems, Data Processing.

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Literature Review Article: 23

Inertial guidance: a brief history and overview I

Description:
his article likely provides a brief history and overview of inertial guidance systems. It may cover the evolution, principles, and applications of inertial guidance technology, offering insights into its significance in navigation and related fields.**Har:2023**

Keywords:
Inertial Guidance, History, Overview, Advanced Navigation, Navigation Systems, Technology Evolution, Principles, Applications

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Literature Review Article: 24

JetBrains PyCharm Learn I

Description:
This is likely a dedicated platform or page where users can access learning materials, tutorials, and documentation related to PyCharm, JetBrains' integrated development environment for Python. It serves as a valuable resource for individuals seeking to enhance their proficiency in PyCharm and streamline their Python development workflow. *JetBrains PyCharm Learn* o. D.

Keywords:
JetBrains, PyCharm, Learn, Educational Resources, Python Development.

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Literature Review Article: 25

The Making of Arduino - IEEE Spectrum I

Description:
The article The Making of Arduino" by David Kushner, published in IEEE Spectrum in 2011, delves into the origin and development of the Arduino platform. It provides insights into the collaborative efforts of the key individuals involved, highlighting the vision, challenges, and innovative spirit that led to the creation of Arduino. The article offers a historical perspective on Arduino's emergence and its impact on the open-source hardware community. Kushner, 2011

Keywords:
Arduino, Open-Source Hardware, David Kushner, IEEE Spectrum, Collaboration, Innovation, Maker Movement, Microcontroller Platform, Electronics Development, Historical Perspective

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Literature Review Article: 26

Magnetometer I

Description:
This specification defines a concrete sensor interface to measure magnetic field in the X, Y and Z axis. The W3C Magnetometer API defines a standardized way for web applications to access data from magnetometer sensors. Magnetometers measure the strength and direction of the magnetic field, making them useful for applications like compass functionality in web-based services. **Kos:2023**
Keywords:
W3C (World Wide Web Consortium), Magnetometer API, DeviceOrientation API, Sensor Data, Magnetic Field, Web Applications, Compass, Interface Specifications, Web Standards, Working Draft.

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Literature Review Article: 27

Bluetooth Low Energy data transfer in energy harvester system: Comparison of platforms and boards I

Description:
This thesis investigates the integration of Bluetooth Low Energy (BLE) technology with energy harvesting in a tiny-scale system. The focus is on comparing development environments for BLE microcontroller boards, such as Ampiq Apollo3 SDK, Mbed Studio, SparkFun Artemis, and Arduino IDE, and evaluating their functionality in a prototype system with an electromagnetic induction-based energy harvester. Laine, 2022

Keywords:
Bluetooth Low Energy (BLE), Energy Harvesting, Microcontroller Boards, Development Environments, Ampiq Apollo3 SDK, Mbed Studio, SparkFun Artemis, Arduino IDE, Prototype System, Electromagnetic Induction-based Harvester, Comparative Analysis, Use Cases, Future Progression Paths, IoT Applications.

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Literature Review Article: 28

Learn PyCharm I

Description:
This platform likely offers tutorials, documentation, and learning materials to enhance proficiency in PyCharm, JetBrains' integrated development environment for Python. It serves as a valuable resource for individuals looking to improve their Python development skills using PyCharm. *Learn PyCharm* 2021

Keywords:
JetBrains, PyCharm, Learn, Educational Resources, Python Development

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Literature Review Article: 29

Survey of Convolutional Neural Networks: Analysis, Applications, and Prospects I

Description:
This review explores the convolutional neural network (CNN) from a comprehensive perspective, covering its history, various convolution techniques, classic and advanced models, and applications in computer vision, natural language processing, and multidimensional scenarios. The paper provides novel ideas and prospects in the evolving field of CNN, addressing both 1-D and multidimensional convolutions. Li u. a., 2021

Keywords:
Convolutional Neural Network (CNN), Deep Learning, Computer Vision, Natural Language Processing, 1-D Convolution, Multidimensional Convolution, Model Overview, Hyperparameter Selection, Experimental Analysis, Open Issues, Future Directions.

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Literature Review Article: 30

Magic Wand Gesture Recorder I

Description:
Specifically focusing on a Magic Wandproject. It likely provides information, documentation, or resources related to implementing machine learning on small and embedded devices for gesture recognition or similar applications. This resource is valuable for those interested in the intersection of machine learning and low-power, edge computing devices. *Magic Wand Gesture Recorder* o. D.

Keywords:
TinyML, Harvard University, Magic Wand, Machine Learning, Tiny Devices, Edge Computing, Gesture Recognition, Embedded Systems

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Literature Review Article: 31

Topic 4: Development of Hand Gesture Recognition Sensor for Underwater ROV Control I

Description:
This paper presents a novel approach to control underwater remotely operated vehicles (ROVs) using a hand gesture recognition sensor. The accuracy of the sensor has been tested, achieving an impressive 98% accuracy rate [**Mardiyanto:2017**]. The main advatage is, in emergency situations, this technology can be crucial for timely and effective search and rescue missions. As The system relies heavily on the proper functioning of the sensors, which may be susceptible to environmental factors underwater.

Keywords:
Hand Gesture, Accelerometer, Gyroscope, 3D Position, Underwater Robot

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Literature Review Article: 32

Miniaturized Wireless IMU Enables Low-Cost Baseball Pitching Training Aid I

Description:
This passage discusses the challenges in baseball pitching and the importance of understanding the free flight behavior of a baseball to prevent mistakes. Existing research focuses on factors like aerodynamic lift coefficient, seam orientation, and angular velocity at release.
McGinnis, Perkins und King, 2011

Keywords:
Baseball Pitching, Free Flight Behavior, Aerodynamic Lift Coefficient, Angular Velocity, High-Speed Video Analysis, Inertial Measurement Unit, Training Aid, Miniaturized Technology, Wireless Sensor, Portable Measurement.

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Literature Review Article: 33

A Highly Miniaturized, Wireless Inertial Measurement Unit for Characterizing the Dynamics I

Description:
This study focuses on distinguishing baseball and softball pitch types by analyzing the angular velocity and velocity of the ball center at release. Existing methods like radar guns and video-based motion capture provide limited insights into these parameters. The proposed solution introduces a highly miniaturized, wireless inertial measurement unit (IMU) embedded in baseballs and softballs, enabling real-time field measurements. McGinnis und Perkins, 2012

Keywords:
Baseball and Softball Pitching, Ball Dynamics, Angular Velocity, Velocity at Release, Wireless Inertial Measurement Unit (IMU), Motion Capture, Pitch Type Analysis, Field Measurements, Sports Technology, Ball-Embedded Sensor.

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Literature Review Article: 34

Outlier detection in wearable sensor data for human activity recognition (HAR) based on DRNNs I

Description:
This paper explores the integration of outlier detection and human activity recognition (HAR) using wearable sensors for personalized applications. A novel algorithm is introduced, leveraging deep recurrent neural networks (DRNNs), to detect anomalies within primary activities and extract data segments of specific sub-activities from different contexts. Munoz-Organero, 2019

Keywords:
Wearable Sensors, Human Activity Recognition (HAR), Outlier Detection, Deep Recurrent Neural Networks (DRNNs), Personalized Applications, Sequential Sensor Data, Sub-activity Recognition, Intra-subject Analysis, Inter-subject Analysis, Generalization, Machine Learning Algorithms, User Context, Time Sequences.

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Literature Review Article: 35

Description:
It could contain valuable information on using Arducam's SPI camera with the Raspberry Pi Pico for implementing machine learning (TinyML) applications, specifically focusing on a Magic Wand project. *Pico4ML Magic Wand Example Update with BLE Enabled - Arducam Wiki* o. D.
Keywords:
Arducam, Arduino, SPI Camera, Legacy SPI Camera, Pico, Pico4ML, TinyML, Magic Wand, Machine Learning, Documentation.

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Literature Review Article: 36

Description:
This comprehensive resource provides information on the Python programming language, including syntax, libraries, modules, and best practices. It serves as a go-to reference for developers, offering detailed documentation and examples. *3.12.1 Documentation* o. D.
Keywords:
Python, Python 3, Documentation, Programming Language, Syntax, Libraries, Modules, Reference.

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Literature Review Article: 37

Python I

Description:
The passage provides an overview of programming languages, emphasizing Python as a versatile and readable language with similarities to others. It highlights the core concepts shared across programming languages, such as variables, functions, and objects. Python's power, elegance, and free availability, coupled with a supportive community, are underscored. Python, 2021

Keywords:
Programming Languages, Python, Java, LISP, PHP, Perl, C, UNIX Scripting, Core Concepts, Variables, Functions, Objects, Code, Ambiguity, Interpreters, Compilers, Machine Code, Community, Free Software

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Literature Review Article: 38

Arduino Nano 33 BLE Sense Review - What's New and How to Get Started? I

Description:
The article on Circuit Digest by Raj, Aswinth provides a comprehensive review and a getting started guide for the Arduino Nano 33 BLE Sense board. It covers an in-depth examination of the features and capabilities of the board, along with a step-by-step guide for beginners to initiate their projects using the Arduino Nano 33 BLE Sense.Raj, 2019

Keywords:
Arduino Nano 33 BLE Sense, Microcontroller Projects, Review, Getting Started Guide, Aswinth Raj, Circuit Digest, IoT, Sensor Integration, Embedded Systems, Bluetooth Low Energy (BLE)

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Literature Review Article: 39

Get Started with Arduino Nano 33 BLE I

Description:
This resource likely includes step-by-step instructions, tips, and information on setting up and using the Arduino Nano 33 BLE, making it an excellent starting point for beginners. *Get Started with Arduino Nano 33 BLE* 2023

Keywords:
Arduino Nano 33 BLE, Getting Started, Arduino Guide, IoT, Embedded Systems, Okdo.

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Literature Review Article: 40

Machine Learning on Mainstream Microcontrollers I

Description:
The book Machine Learning on Mainstream Microcontrollers" by akr, Fouad, Bellotti, Francesco, Berta, Riccardo, and De Gloria, Alessandro explores the integration of machine learning techniques into mainstream microcontrollers. It provides insights into implementing machine learning algorithms on resource-constrained devices, making it accessible for a wide range of applications on low-power embedded systems. Sakr u. a., 2020

Keywords:
Machine Learning, Microcontrollers, Embedded Systems, Low-Power Devices, Algorithm Implementation, Edge Computing, IoT, Sensor Integration, Resource-Constrained Platforms.

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Literature Review Article: 41

Practical Convolutional Neural Networks: Implement Advanced Deep Learning Models Using Python I

Description:
The book Practical Convolutional Neural Networks: Implement Advanced Deep Learning Models Using Pythonïs a comprehensive guide that delves into the practical implementation of advanced deep learning models, specifically focusing on Convolutional Neural Networks (CNNs). It provides hands-on examples and applications using Python, offering practical insights into developing and deploying CNNs for various real-world tasks. Sewak, Karim und Pujari, 2018

Keywords:
Convolutional Neural Networks (CNNs), Deep Learning, Python, Model Implementation, Advanced Neural Network Models, Practical Applications, Hands-On Examples, Deep Learning Deployment.

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Literature Review Article: 42

Edge Computing: Vision and Challenges I

Description:
The paper explores the paradigm of edge computing driven by the rise of the Internet of Things (IoT) and the success of cloud services. It defines edge computing and presents case studies, including cloud offloading, smart home and city applications, and collaborative edge scenarios, highlighting its potential in addressing response time, battery life, bandwidth, and data safety concerns.Shi u. a., 2016

Keywords:
Edge Computing, Internet of Things (IoT), Cloud Offloading, Smart Home, Smart City, Collaborative Edge, Data Privacy, Response Time, Battery Life, Bandwidth Optimization

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Literature Review Article: 43

Machine learning with TensorFlow I

Description:
The book Machine Learning with TensorFlow" by Shukla, Nishant, and Fricklas, Kenneth (2018) provides a comprehensive guide to implementing machine learning algorithms using TensorFlow. It covers fundamental concepts, practical applications, and hands-on examples, enabling readers to develop proficiency in machine learning using the popular TensorFlow framework. Shukla und Fricklas, 2018

Keywords:
Machine Learning, TensorFlow, Deep Learning, Neural Networks, Data Science, Model Implementation, Hands-On Examples, TensorFlow Framework, Practical Applications

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Literature Review Article: 44

LSM9DS1 - iNEMO inertial module: 3D accelerometer, 3D gyroscope, 3D magnetometer I

Description:
The LSM9DS1 - iNEMO inertial module is a versatile sensor unit equipped with a 3D accelerometer, 3D gyroscope, and 3D magnetometer. This compact module provides comprehensive motion sensing capabilities, making it suitable for applications requiring precise orientation and movement tracking. STMicroelectronics, 2015

Keywords:
LSM9DS1, iNEMO, Inertial Module, 3D Accelerometer, 3D Gyroscope, 3D Magnetometer, Motion Sensing, Orientation Tracking, Sensor Unit.

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Literature Review Article: 45

LPS22HB - MEMS nano pressure sensor: 260-1260 hPa absolute digital output barometer I

Description:
The LPS22HB is a MEMS nano pressure sensor capable of providing absolute digital output barometric readings in the range of 260-1260 hPa. This compact sensor is designed for precision pressure measurements and offers a digital interface for easy integration into various applications.
STMicroelectronics, 2017

Keywords:
LPS22HB, MEMS, Nano Pressure Sensor, Barometer, Digital Output, Pressure Measurement, Absolute Pressure, Atmospheric Pressure.

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Literature Review Article: 46

MP34DT05 - MEMS audio sensor omnidirectional digital microphone I

Description:
The MP34DT05 is a MEMS audio sensor, specifically an omnidirectional digital microphone. This compact and versatile sensor is designed to capture audio in all directions and provides digital output. It is suitable for various applications requiring high-quality sound capture in a small form factor. STMicroelectronics, 2021

Keywords:
MP34DT05, MEMS, Audio Sensor, Omnidirectional, Digital Microphone, Sound Capture, Sensor.

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Literature Review Article: 47

HTS221 - Capacitive digital sensor for relative humidity and temperature I

Description:
The HTS221 is a capacitive digital sensor designed for measuring relative humidity and temperature. This sensor provides accurate and reliable readings, making it suitable for applications where monitoring environmental conditions is essential. STMicroelectronics, 2023

Keywords:
HTS221, Capacitive Digital Sensor, Relative Humidity, Temperature Sensor, Environmental Monitoring.

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Literature Review Article: 48

TensorFlow:2023 I

Description:
TensorFlow Lite is designed for mobile and edge devices, allowing developers to deploy machine learning models on resource-constrained platforms. It supports model conversion, optimization, and inference for a variety of devices, enabling efficient and fast execution of machine learning models in real-world applications. Key features include support for on-device training, quantization techniques, and compatibility with various hardware accelerators. *TensorFlow Lite | ML for Mobile and Edge Devices* o. D.

Keywords:
TensorFlow Lite, Mobile Devices, Edge Computing, Model Conversion, Optimization, Inference, On-device Training, Quantization, Hardware Accelerators, Real-world Applications

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Literature Review Article: 49

3-Axis Accelerometer I

Description:
A 3-axis accelerometer is a sensor that measures acceleration in three dimensions: along the x, y, and z axes. This device is commonly used in various applications, including motion sensing, orientation tracking, and gesture recognition, providing crucial data on changes in velocity and tilt.
Vernier Software & Technology, 2023

Keywords:
Acceleration, Motion Sensing, Orientation Tracking, 3D Accelerometer, Sensor Technology, Inertial Measurement, Triaxial Sensor, XYZ Axes, Gesture Recognition, Motion Analysis

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Literature Review Article: 50

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TinyML: Machine Learning with TensorFlow Lite on Arduino and Ultra-low-power Microcontrollers I

Description:
TinyML: Machine Learning with TensorFlow Lite on Arduino and Ultra-low-power Microcontrollersëxplores the integration of machine learning on resource-constrained devices, providing practical insights and applications using TensorFlow Lite on Arduino and ultra-low-power microcontrollers. Warden und Situnayake, 2020

Keywords:
TinyML, Machine Learning, TensorFlow Lite Arduino, Ultra-low-power Microcontrollers, Embedded Systems, Edge Computing, IoT, Sensor Integration

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Literature Review Article: 51

Knowledge Discovery in Databases Process I

Description:
This document explores the Knowledge Discovery in Databases (KDD) process, emphasizing key stages such as data selection, preprocessing, transformation, and interpretation. It employs techniques for uncovering patterns and trends in large datasets, enhancing decision-making. Wings, 2022
Keywords:
KDD, data preprocessing, pattern discovery.

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Literature Review Article: 52

Convolution Neural Networks for Image Analysis I

Description:
Focused on image analysis, this document delves into Convolutional Neural Networks (CNNs), powerful tools for extracting features and patterns from visual data. The application of CNNs is explored for image recognition and analysis, showcasing their effectiveness in computer vision tasks. Wings, 2023b

Keywords:
CNNs, image analysis, computer vision.

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Literature Review Article: 53

Artificial Intelligence with an Arduino Nano 33 BLE Se Realtime Object Detection with the ArduCAM I

Description:
This document presents the integration of Artificial Intelligence (AI) using an Arduino Nano 33 BLE Sense, coupled with ArduCAM, for real-time object detection. It combines the capabilities of AI algorithms with the Arduino platform, enabling efficient and compact solutions for recognizing and responding to objects. Wings, 2023a
Keywords:
AI, Arduino Nano 33 BLE, real-time object detection, ArduCAM.

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Literature Review Article: 54

Gesture recognition using dual-stream CNN based on fusion of sEMG I

Description:
The paper addresses the challenges of recognizing human actions based on surface electromyography signals (sEMG) by proposing a dual-stream convolutional neural network (CNN). By fusing features from sEMG energy kernel phase portraits and inertial measurement unit (IMU) data, the method achieves a notable average recognition accuracy of 95.78% for six gestures performed by five subjects, demonstrating improved stability and performance in human gesture recognition. Xu u. a., 2022

Keywords:
sEMG, Gesture recognition Energy kernel, CNN, IMU

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Literature Review Article: 55

Gyroscopes: Principles and Applications I

Description:
This abstract reviews the classical structure and performance parameters of interferometric fiber-optic gyroscope (IFOG) and integrated optics passive resonator gyroscope (IORG). It outlines advanced models, performance parameters, and design trends for both types of rotation-rate inertial sensors. A comparative analysis based on performance parameters categorizes them into six levels, enabling insights into their application areas in aeronautics, aerospace navigation, micro-fabrication, tactical weapons, and robotics.Zhuang und Zhou, 2020
Keywords:
Interferometric fiber-optic gyroscope (IFOG), integrated optics passive resonator gyroscope (IORG), optical passive ring resonator interferometer, single-mode fiber (SMF), silicon wire waveguide

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