

DEFENDER DIAGNOSTIC SCANNER



Introduction

On-Board Diagnostics (OBD) in an automotive context is a generic term referring to a vehicle's self-diagnostic and reporting capability. OBD systems give the vehicle owner or a repair technician access to information regarding the state of health of various vehicle sub-systems. All modern vehicles which are being procured by Pakistan Army today include an Engine Control Unit (ECU). The test equipment required for reading diagnostic information is very expensive keeping in view our local economy.

Features

- Parameter Identifiers (PIDs)
- Data Trouble Codes (DTCs)
- Troubleshooting manual
- Carry out function tests



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Product Market

- Military & Government Organizations
- Automobile Diagnostic Centers
- Automobile Maintenance Centers / Workshops

GROUND SERVEILLANCE RADAR MAHZ - 1



Introduction

MAHZ-1 is a modern solid-state coherent Pulse Doppler radar. The radar operates in Ku band and is capable of detecting moving targets on ground and provides their range, azimuth, speed, direction of travel and target location in GPS coordinates and 6 figures Grid Reference.

Features

- Max Range (Pedestrian) : 3 km
- Max Range (Vehicle) : 6 km
- Detectable Object Velocity : 3 – 168 km/hr
- Field of Scanning : 0 – 360°
- Dead Zone : 200 ms

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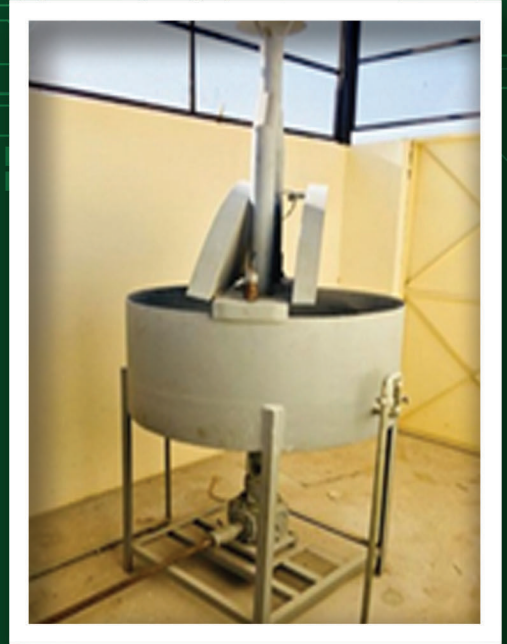
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Product Market

- Military & Government Organizations
- Safe City Projects
- Private Industry

Waste Energetic Material Conversion Plant



Introduction

Waste energetic materials contains enormous amount of heat energy, which is wasted through multiple disposal techniques, thus producing severe health hazards, besides, giving rise to Environment Protection Agency (EPA) concerns. This project has achieved optimum re-utilization of waste energetic materials through state-of-the-art, safe, feasible and environment friendly process. The process is not only an advance but also more acceptable whereby waste energetic materials are converted into new blasting explosives, for use in civil and defense sectors.

Features

- 1st ever plant manufactured for formulation of blasting explosives using waste energetic materials, in Pakistan
- Environment friendly, addresses EPA, PAK-EPA Concerns
- Enhances Carbon Credit Ratings of Pakistan
- Best Velocity of Detonation (VOD) results
- Lower cost, high reliability and safe in handling

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Product Market

- Defence Sector
- Cement Industry
- Coal Mining Industry

Unmanned Ground Vehicle

Introduction

Unmanned Ground Vehicles (UGV) are robotic platforms which are used as an extension of human cap. This type of robot has a general capability of operation; outdoors and over a wide variety of terrain, functioning in place of humans. Various add-ons can be fitted like gun or camera as per the need of the mission.

Features

- Survey of the unknown / built up area with help of on-board cameras without human involvement from a remote location and identify the target
- Aiming at the target with the pan tilt weapon mount
- Engagement of target with the help of trigger con of weapon
- Useful for use in close quarter battle in built up areas
- Useful for the special operations carried out against the terrorists in hostage situation



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Product Market

- Security Agencies
- Disaster Management Organization
- Mining Industry

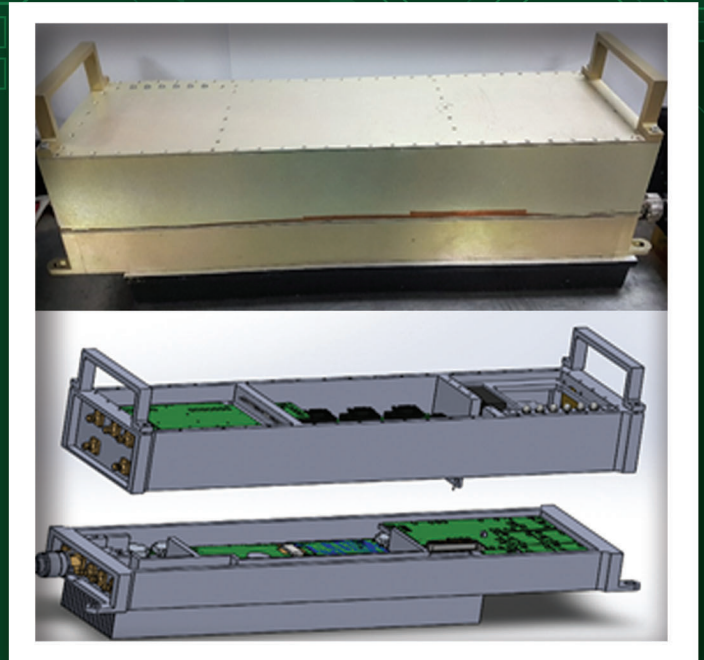
Transceiver Module for Surveillance RADAR

Introduction

The developed transceiver module is a key component for Pakistan's indigenous surveillance RADAR and an effort towards making the nation self-reliant in critical technologies.

Features

- Suitable for Active Phased Array Radar
- Frequency Range : S-band
- Single Transmitter with 400 watt Peak power
- Two receivers one for sum and other for azimuth channel
- An FPGA based controller board for weighting and phase control of transceiver
- Built-in test for health monitoring



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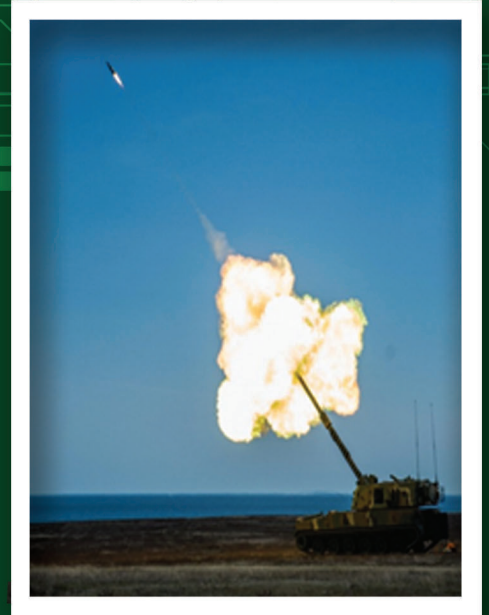
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Product Market

- Defence Sector
- Law enforcement agencies

Base Bleed Composite Solid Propellant and Igniter for 155 mm Artillery Projectile Base Bleed Unit



Introduction

Base drag is created due to partial vacuum behind projectile (50% of total drag force) during flight. Base bleed unit decreases the base drag by filling up the wake zone with hot gases to gain ambient pressure produced by combustion of composite propellant grain and range is extended typically by 25-30%. A novel AP/HTPB based composite solid propellant grain has been designed and developed with perfect mechanical and ballistic properties together with a highly reliable pyrolant based Igniter for ignition and stable performance of Base Bleed Unit. This Base Bleed unit has been developed for a new generation of Extended-Range artillery. The artillery projectile has enhanced operational range enabling artillery to engage and destroy targets while being well beyond the range of enemy fire.

Features

- Base Bleed grain technology indigenously developed in Pakistan
- Indigenously produced Base Bleed grain with desired mechanical and ballistic properties
- Indigenously developed highly reliable and compact pyrolant based igniter
- 25-30% range enhancement achieved with 155 mm HE projectile.

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Product Market

- Defence Sector



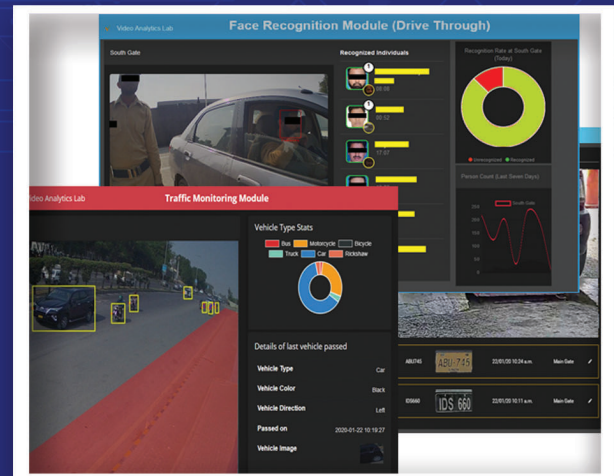
Augmenting Safety And Security Using Video Analytics

Introduction

Monitoring multiple surveillance cameras feed in real-time is a huge challenge for a human observer. Video Analytics (VA) is a software-based solution to autonomously identify events of interest in visual feeds and adds an intelligence layer to increase the effectiveness of surveillance system operation. Software solutions available in the market have their own limitations like low accuracies in the South Asian environment (due to complex and varying local dynamics), sharing and maintenance dependencies on these companies and licensing issues etc. This envisages indigenous development of VA solution adaptable to our local environment. The solution is now available and ready for deployment.

Features

- Facial recognition (Integrable with Personnel Access Control)
- Automatic License Plate Recognition (Integrable with Vehicle Access Control)
- Single image based facial training
- Traffic Monitoring
- Log keeping
- Query based search
- Image enhancement
- Customizable solution as per user requirement



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Product Market

- Military & Government entities
- Safe City Projects
- Private Industry



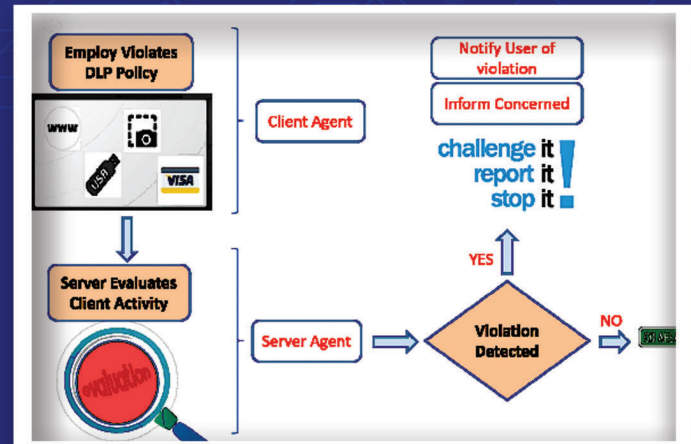
CYBER GUARD: A Data Loss Prevention Toolkit

Introduction

Data loss can occur due to intentional misuse, carelessness or theft. The role of Cyber Guard is to identify, monitor and protect data in storage, track it as it moves over the network or it is being copied, saved, or printed. Cyber Guard then takes actions based on pre-defined policies to prevent unauthorized access or usage of confidential data.

Features

- Indigenous and cost-effective
- Able to protect outgoing data on network (including http/https).
- Enforces organizational policies on the server
- Prevents operations that causes data breaches such as using removable media, printing, screenshot, copy/paste etc.
- Scans database and quarantines sensitive data found
- Platform/OS/browser independent solution
- Supports Windows and Linux platforms along with android application for mobile support
- Scalable



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Product Market

- Defence & government organizations
- Security conscious companies
- Banks and financial institutions



Antenna Arrays with Wide Bandwidth, High Gain and Wide Azimuth Beamwidth for Passive Sensing



Introduction

Passive radar systems are increasingly becoming more popular because of the evident reason; they cannot be detected. These systems use reflections of signals from unrelated sources e.g. analog/digital television, FM radio, cellular phones, GPS etc. to sense a target. These systems should be able to detect very small levels of echo signals in a background of strong interference. The receiver thus should have a very low noise figure and complex signal processing capabilities. In addition, the antenna for such systems must comply to a certain set of specifications. This includes wider beamwidth, reasonable gain and impedance bandwidth wide enough to cover the intended range of frequencies. We have developed antenna arrays that can be used for passive radar systems operating within the L-band and S-band of microwave spectrum

Features

- Covering the typical bands of communication of the airborne platforms
- Wider azimuth beamwidth for wider coverage
- Narrower elevation beamwidth for detecting and ranging
- High gain antennas
- High fractional bandwidth

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Product Market

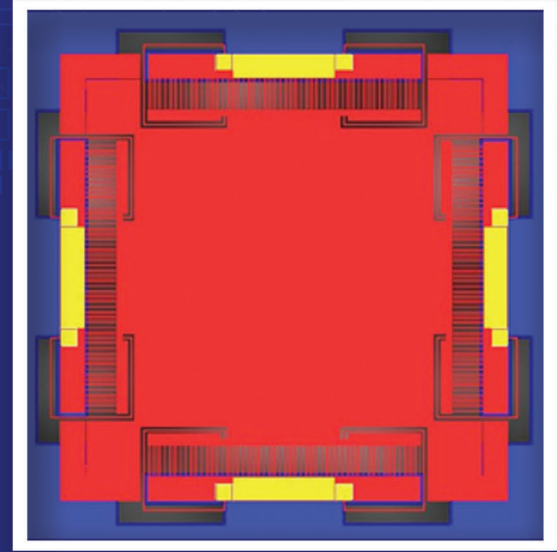
- Defence Sector
- Law Enforcement Agencies



Tactical Grade MEMS Inertial Sensors

Introduction

The main objective of this project is to indigenously develop tactical grade MEMS inertial sensors (micro-accelerometers and micro-gyroscopes) for UAV applications using fabless prototyping.



Features

- Electrostatic Sensing Mechanism
- SOI with 25 μm Thickness
- $\pm 25\text{g}$ Input Range
- Overall Size
- Resolution: 5 mg
- Bandwidth: up to DC-400 Hz
- Mechanical Sensitivity: 0.021 $\mu\text{m/g}$
- Capacitive Sensitivity: 21fF/g
- Voltage Sensitivity: 72 mV/g
- Operating Temperature: -40C to 100C

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Product Market

- Strategic Organizations
- Military Equipment
- Consumer Electronics

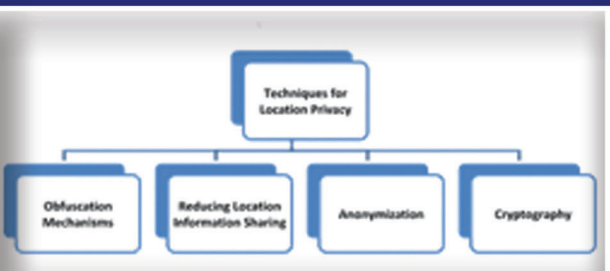
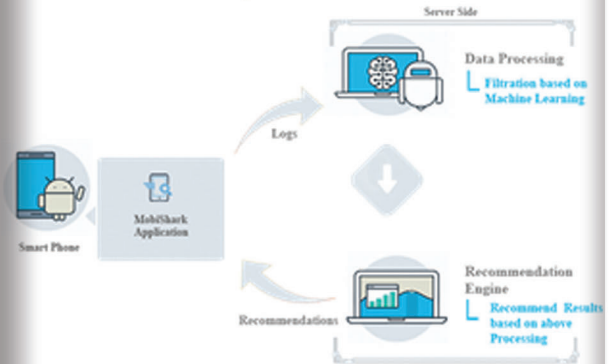


Mobi Shark

Introduction

Mobi Shark is a specialized mobile toolkit to secure and protect user's location. It is a framework that randomize user's GPS coordinates and send spoofed coordinates data to big giants which are continuously tracking and monitoring user's activities. This software ensures that these big giants can no longer track users, as our application provides higher spoof accuracy of nearest coordinate with the controlled randomization of 5 to 10 km. These spoofed coordinates do not allow the tracking of user's exact location.

MobiShark Techniques for Location Privacy



Features

- Ensure less privacy leaks in public and private sector organizations
- Long lasting spoofed location assurance
- Ease of use and highly accurate
- Stops tracking and spying of users activity by big giants
- Applications that utilize user location services full time for their functionality even in background while users' are not using those applications will not be able to spy.

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Product Market

- Military & other Law Enforcing Agencies
- Public and Private Sector Organizations



Operating System Compliance Toolkit (OSCT)



Introduction

OSCT is a portable solution for security assessment of Microsoft Windows platform. It provides safety against unwanted data collection by software vendors and verification of compliance against security standards.

Features

- Identify weaknesses in your digital infrastructure.
- Update cybersecurity defenses
- Remediate cybersecurity issues
- Protect your business from cyber-attacks and help your organization follow standards and laws
- Allows auditors to digitally sign reports, in order to preserve the chain of custody thereby allowing the reports to be used for digital forensics
- Easy to manage across large organizations with large IT infrastructure

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Product Market

- Military & other law enforcing agencies
- Public and private sector organizations
- Healthcare sector
- Banking & Finance sector
- Education sector



Pasbaan Sandbox

Introduction

The primary objective of this product is to detect samples that remain undetectable through conventional detection mechanisms i.e. Anti-viruses. It uses Artificial Intelligence techniques on both static and dynamic features to predict the ground truth status of a file. Moreover, it provides high detection accuracy.

Features

- Detection of malwares using static and dynamic indigenously developed deep learning techniques
- Incorporation of off-the-shelf detection software to make development fast, cost-effective and easy
- Enhanced detection due to amalgamation of various hardening techniques in the sandbox
- Use of multiple detection plugins make it very competitive at a very low development cost while providing high-end reliability and protection

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Product Market

- Military & Other Law Enforcing Agencies
- Public and Private Sector Organizations
- Healthcare Sector
- Banking & Finance Sector
- Education Sector

Engine Test Cell and Engine Blow by Monitoring System



DEPLOYMENTS:

Millat Tractors, Engine Test Cell

A state-of-the-art engine test cell facility for Millat Tractors in Lahore

AUDI TDI Tappet Rotation Test Rig

Instrumented TDI 1.9-liter engine head with special sensors for monitoring tappet behavior. Effect of engine operating conditions and lubricant formulation on tappet performance is analyzed on this test rig.

CUMMINS Valve Train Test Rig

Heavily instrumented engine having push rod configured power train, for fuel economy and coating studies. Advanced data acquisition system was used for synchronized simultaneous measurement of vital parameters for tribological analysis.

Toyota Prius Roller-Follower Test Rig

Test rig capable of investigating the slip of roller follower in Toyota Prius engine. Effect of engine operating conditions and additive packages on engine performance can be tested on this instrumented system.

Universal Vibration Test Rig

Developed vibration test rig for testing military equipment. Single axis vibration test rig with variable amplitude and frequency control.

Universal Engine Head Test Rig

Developed engine head test rig for detailed testing of engine head performance under realistic conditions.

OM646 Benz Camshaft Friction Test Rig

Developed camshaft test rig for oil film strength and sliding friction measurement.ors and Generators.

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Product Market

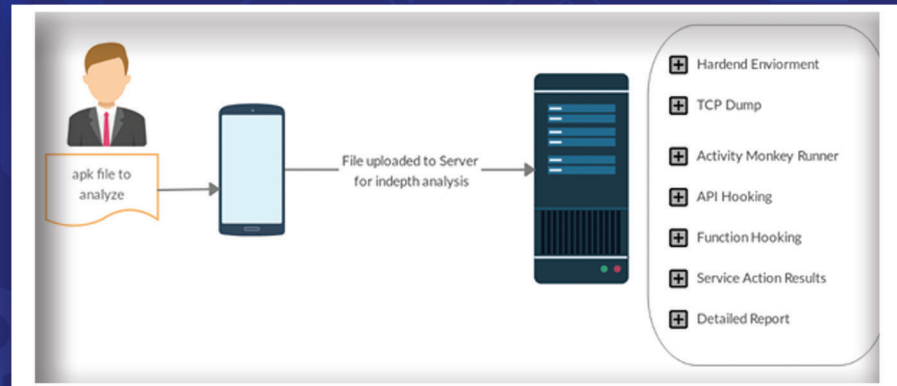
- Defence Sector
- Auto Industry



Mobi SandBox

Introduction

Mobi Sandbox is an android based vulnerability analysis framework designed to help developers find potential security vulnerabilities in android applications. It is an application security solution for vulnerabilities that can help mobile application developers in the detection of a variety of potential threats and vulnerabilities, which can then be resolved during the SDLC.



Features

- Mobi Sandbox provide a rich feature set based on static and dynamic analysis of android applications
- Check dangerous shell commands (e.g. "su")
- Inadvertently exported components
- Improperly protected exported components
- Intents which are vulnerable to interception or eavesdropping
- Improper x.509 certificate validation
- Activities which may leak data
- Insecurely created Pending Intents
- Apps which enable backups
- Vulnerability free applications ensures organizational reputation in the market
- Application security scanning using static and dynamic analysis helps guarantee that mobile apps are safe and protected against cyber attacks

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Product Market

- Government military organizations
- Law enforcement agencies
- Private and corporate sector



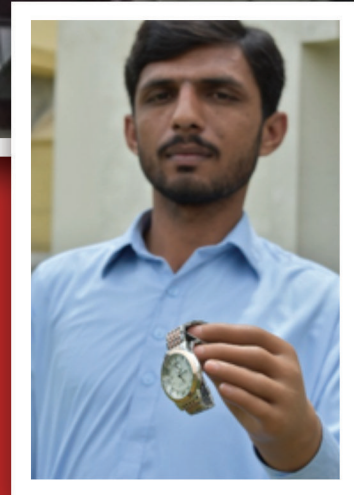
MYOELECTRIC PROSTHETIC UPPER LIMB

Introduction

The primary objective of this product is to transform the lives of amputees, by helping them regain their confidence and sense of independence while performing daily tasks. In order to facilitate such patients, a robust, reliable and cost-effective myoelectric prosthetic limb has been developed to greatly assist in rehabilitation.

Features

- Myoelectric prosthetic upper limb can assist the amputee in his / her daily tasks
- The mechanism contains 1 Degree of Freedom movement with pinch and grip capability
- The movement signals are acquired from the active muscles of the patient
- Amputees can grasp the objects easily and precisely
- Rechargeable Limb with ON/OFF Switch
- Non-invasive permanent Electrodes
- Light weight and affordable



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Product Market

- Private & Government Hospitals
- Rehabilitation Centres