REAL TIME DATA PROCESSING AND ANALYSIS USING MATLAB
(Data visualization and Analysis)

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Thanks
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OUTLINE

• Data Network
• Present Scenario & Software requirement
• Software module-MATLAB
• Coastal drifting buoy (CDB)-Introduction
• CDB software Module
• Automatic Weather Station Network-Introduction
• AWS Software module
• Conclusion
COASTAL DRIFTER SYSTEM

AWS & DRIFTING BUOY DATA FLOW STREAM

DATA NETWORK
PRESENT SCENARIO & SW REQUIREMENT

- Server access-FTP
- Decoding As per Format-ASCII &Hex
- Simple coding & Debugging
- Data base linking
- Exporting option-Excel, txt.
- GPS Coordinates plot
- Google Earth link

FTP server Access ➔ Decode & Analysis ➔ DataBase & Sharing

Easy coding & Analysis
SOFTWARE MODULE-MATLAB

SOURCE : MATHWOKS WEBSITE
Introduction

- Drifter buoy is a floating device deployed at sea to collect, process Meteorological/Oceanographic parameters like Sea Surface Temperature, Air Pressure, Sea Surface Salinity with GPS Position data and transmit the data sets to shore station using INSAT communication module. Drogue acts as the sea anchor.

- The Ocean mixed layer surface current measurement is derived from the GPS position data obtained.
Coastal Drifter

Coastal Drifter Buoy works with high data transfer rate GPRS communication module.

Special type Micro star suitable for coastal current measurement was implemented.

Field trials proved that Coastal drifters follow the Surface current following characteristic very precisely.

Data sets of Off-Rathnagiri-Maharashtra coast deployment plotted in google map suing the developed software module.
SCIENTIFIC UTILITY OF DRIFTER BUOY DATA

• Used mainly to understand the role of ocean on climate change and further evolution of future climate changes.

• Drifters Sea Surface Temperature (SST) and ocean near surface circulation data sets are used for testing climate models and enhancing long-range weather prediction.

• SST data sets are used to understand on ocean circulation, ocean diffusivities as well as air-sea interaction.

• Sea Surface Salinity (SSS) data are critical in determining the ocean’s fresh water cycle and onset of deep-water renewals.

• Air pressures measurements are assimilated into weather prediction models and are used by operational meteorological agencies to discern severe weather conditions over the oceans.

• Validation of satellite retrieved data.
CDB SOFTWARE MODULE USING MATLAB

Data Export in to Excel

Station Names

Data Plot
SETTING GUI

- New system including
- Existing one or unwanted removal
GEOGRAPHIC MAP FOR TRACKING

- Red mark show the current position
- Boundaries different can be plotted.
REAL TIME UPDATE

- Update done by specifying interval.

- Timer enabling and disabling is utilized in the automatic option.

- Customization could be useful for real time data updation.
AWS - INTRODUCTION

- Automatic weather station (AWS) is an automated version of the traditional weather station, reducing manual measurements.

- Typically consist of a weather-proof enclosure containing the data logger and meteorological sensors and mounting structures.

- Remote locations weather monitored

- Data Reception implementing INSAT communication
APPLICATION

- Coastal weather monitoring and forecasting
- Agriculture
- Renewable energy Resources
AWS SOFTWARE MODULE USING MATLAB

- Data Reception Automated
- Ship status monitoring - SAWS
- Coastal weather data monitoring - LAWS
- Data exporting into Excel, txt etc
- Google Earth linking
- Update in an hour
DECODING & DATA BASE LINKING

- Combination different format at decoding
- Separation and Comparison of bytes
- Discarding of unknown character
- Sensor and GPS data stored to data base.

40 bytes Data

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SHIP TRACKING
SHIP TRACK & GOOGLE EARTH LINKING BY MATLAB

M.V Caraval Pride

M.V NanCowry
CONCLUSION

• MATLAB tool with GUI are very simple to process and does not require expert.

• Ship tracking using GPS co ordinates achieved.

• Data analysis and database access become simple.

• MATLAB features are wide.

• Simple to Debug.
Thank you