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1 WALSAIP Project Description

The **Wide Area Large Scale Automated Information Processing (WALSAIP)** project is developing a conceptual framework for the automated processing of information arriving from physical sensors in a generalized wide-area, large-scale distributed network infrastructure. It is focusing on **water-related ecological** as well as **generalized environmental** applications.



The Jobos Bay NERRS (Left), which is located at Aguirre, PR, serves as a local Testbed.

Jobos Bay's **unique characteristics** have made the reserve a special part of the WALSAIP Project.

Environmental Surveillance* Monitoring (ESM)

It deals with the **gathering** and **processing** of appropriate environmental information to aid in the process of effective decision making!

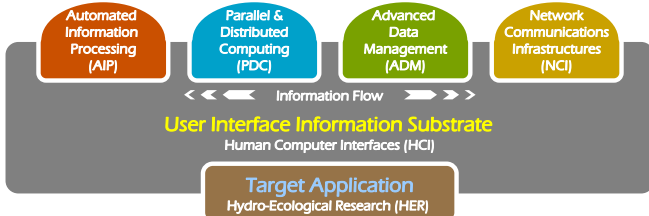
ESM-Adaptive Management Concept



*From French: sur- 'over' + veiller- 'watch'

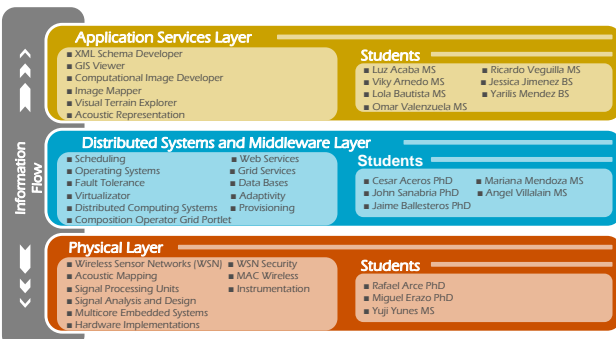
2 WALSAIP's R&D Framework

A Framework for Computational and Information Processing



This graph shows the interaction among all six (6) WALSAIP's research and development groups.

3 WALSAIP's Students Layered Research

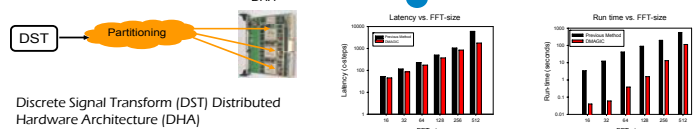


Graduate and undergraduate students are supporting the WALSAIP project in multidisciplinary research endeavors which have been classified into three main layers, namely, the physical layer, the distributed systems and middleware layer, and the application services layer

4 WALSAIP's Research Results

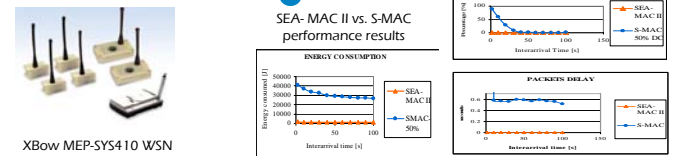
High-level Partitioning of Discrete Signal Transforms for Distributed Hardware Architectures

Rafael Arce, PhD Student



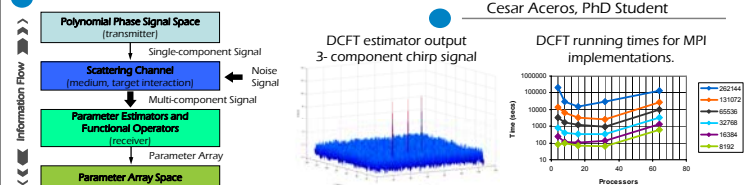
Analysis and Design of a MAC Protocol for WSN with Periodic Monitoring Applications

Miguel Erazo, PhD Student



Signal Operator Algebras Framework over Distributed Signal Processing Systems

Cesar Aceros, PhD Student



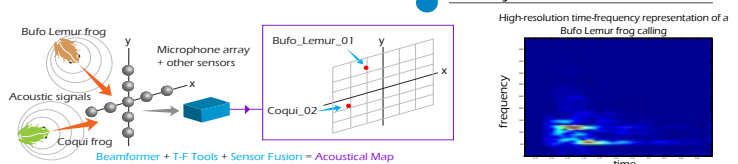
Provisioning and Orchestration in Distributed Wide Area Large Scale Infrastructures

John Sanabria, PhD Student



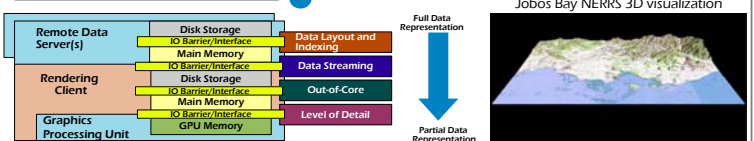
Distributed Sensor Signal Acquisition, Analysis, and Representation for ESM Applications

Yuji Yunes, MS Student



A Java-based Tool for Accurate, Interactive 3D Terrain Visualization: Visual Terrain

Ricardo Veguilla, MS Student



5 WALSAIP Latest Student Publications

- [1] R. Arce Nazario, M. Jimenez, D. Rodriguez. "Partitioning Exploration for Automated Mapping of Discrete Cosine Transforms onto Distributed Hardware Architectures". Accepted to the 50th IEEE Midwest Symposium on Circuits and Systems. Montreal, Canada, August 2007.
- [2] R. Arce Nazario, M. Jimenez, D. Rodriguez. "Algorithmic-level Exploration of Discrete Signal Transforms for Partitioning to Distributed Hardware Architectures". Accepted for publication on Journal of IET Computers & Digital Techniques, April 2007.
- [3] M. Erazo, Y. Qian, "SEA-MAC: Simple Energy Aware MAC Protocol for Wireless Sensor Networks for Environmental Monitoring", Proceedings of IEEE ISWPC'2007, San Juan, PR, February 2007.
- [4] D. Arias, J. Sanabria, W. Rivera. "Grid Based Pervasive Distributed Storage" Proceedings of IEEE ISWPC'2007, San Juan, PR, February 2007.

