

HIGH LEVEL TECHNOLOGIES FOR A RURAL VILLAGE IN THE PHILIPPINES IMCS17

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HISTORY AND BACKGROUND

www.amyrobotics.com www.enhanceavillage.org

AMY ROBOTICS LTD

- VP Operations US
- Customizable
- B2B AR / AI / Database
- ENHANCE A VILLAGE
 - Chief Operations
 - 501-3c Non Profit
 - loT
 - Teams of Professionals
 - Writers, Tech, Farming







RURAL

RURAL AREAS

- Impoverished Populations
- Challenging to get Basics
 - Water / Food
 - Shelters
- How to Balance Out?
- How to Max Resources & Production to Benefit All?



METROPOLITAN

CONTRAST **METROPOLITAN AREAS**

- Shared Infrastructure
- Shared Technology
- Shared Support
- Shared Programs

LETS GET STARTED



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MEMORY PLATFORM

SQL ENGINE = DATA COLLECTION, DISPLAY, STORAGE

TRADITIONAL DISK DB

- Subjected to Wear, Recover Issues
- Subject to Weathering & Delicate
- Theft, Obsolete, Costly, Slow

IMDB

- Cloud Based Oriented Algorithms
- Durable, Inexpensive, Fast
- In-Memory Storage Manager





SQL: MEMORY COLLECTION FROM IOT DEVICES IN THE FIELD

COMMUNICATION THROUGH SAT

IOT PLATFORM

- Monitor Devices
- Manage Devices
- Control Connected Devices to SAT
- APPLICATION EXAMPLES
 - Water Management Control, Divert
 - Soil Monitoring Grow Quality
 - Livestock Tracking Locate, Count, Duration
 - Crop Monitoring using Drone
 - Equipment Tracking



IOT COLLECTION IN THE FIELD

REMOTE DATA COLLECTION FROM CONNECTED DEVICES

- Can be Independent
- Secures Connectivity Between Devices
- DEVICE / SENSOR MANAGEMENT
 - Can Measure Chemistry / Physics
 - Can Measure Solar / Physical Temp
 - Can Measure Wind
 - Can Measure Voltage / Current
 - Can track GPS Motion
 - (Wandering Animals)





CUSTOM REAL TIME REMOTE DATA COLLECTION SYSTEMS

WEATHER, WATER LEVEL, WATER QUALITY SENSORS

- INTEGRAL RADIO CONTROLLER W/ SOLAR PANEL & BATTERY
- CELL PHONE TOWER
- INTERNET
- REAL TIME DATA DISPLAY



Politics in Rural Villages

QUANTITATIVE REMOTE SENSING APPLICATION

CAN DATA BE DISPLAYED AND REVIEWED?

Quantitative Remote Sensing Application

GIS SCIENCE

Object-Based Image Analysis (OBIA)

Devoted to partitioning remote sensing (RS) imagery into meaningful image-objects

3 RS RESOLUTION characteristics

Spatial, Spectral and Tempora



#1. SPATIAL RESOLUTION

- Assessing Remote Sensing
 - (RS) characteristics MEMORY STORED, TRACKED AND STATISTICS
 - Spatial (AREA)
 - Resolution
 - Pixel Size
 - Display
 - Pixel Output

CHARECTERISTICS OF SENSORS

Spatial resolution



#2. SPECTRAL RESOLUTION

- Assessing Remote Sensing
 - Wavelength Intervals
 - BLACK AND WHITE
 - COLOR FILM
 - DIGITAL

Spectral resolution



#2.1 DIGITAL "HIGHER" SPECTRAL RESOLUTION

- Assessing Remote Sensing
 - FINER WAVELENGTH RANGES
 - Digital Spectral Resolution Based on Bandwidth from Land Sat/TM 5

Spectral Resolution (2)

A sensor with higher spectral resolution is required for detailed distinction.

Spectral resolution describes the ability of a sensor to define fine wavelength intervals

The finer the spectral resolution, the narrower the wavelength range for a particular channel or band.

Spectral Definition (µm) - Landsat/TM 5





Landsat/TM 5

#3 TEMPORAL SCALE

- Logarithmic Timeline
- Life Span
 - (Lifetime)(Years)(Months)
 - (Days)(Hours)
- Duration
 - (MEASURE OF TIME)

TRENDS TO HELP PRODUCTION TRENDS TO SUSTAIN LIFE



#3.1 EXAMPLE TEMPORAL SCALE

- EXAMPLE NEAR
 - BATHINDA, INDIA
- ASSESSING REMOTE SENSING
 - Temporal Scale
 - SHOWS SEASONAL VARIABILITY OF VEGETATION
 - GREEN = HIGH
 - YELLOW=MEDIUM
 - ORANGE = LOW
 - NOTE RIVERS!



REMOTE SENSING

- REMOTE SENSING IS THE SCIENCE OF OBTAINING INFORMATION ABOUT OBJECTS OR AREAS FROM A DISTANCE
 - Aircraft
 - Helicopters
 - Airplanes
 - Drones
 - Satellites
 - Orbital
 - Stationary

Remote sensors can be either passive or active.



REMOTE SENSING PASSIVE

PASSIVE SENSOR RESPONDS TO COLLECTED EXTERNAL STIMULI

Heat warms liquid, Thermocouple (analo sensor) changes varyin to a Signal Condit System

liquid, (analogue varying voltage Conditioner or

Output Signal collected by satellite, to radar antenna



REMOTE SENSING ACTIVE

Active Sensors Respond to Beam Stimuli

Satellite Beams to Ground, Information Reflected Back to Satellite and Sent to Radar Antenna Infrared IR Transmitter Infrared IR Receiver

Reflections Surface Object Body



REMOTE SENSING OBSERVING FROM A DISTANCE

- ENERGY SOURCE
 - Sun, Wind, Rivers

TARGET

- Ground, Rivers, Lakes, Buildings
- SAT "SENSOR"
- PROCESSING STATION
 - Secured, Distributed
 - Memory Recorded
- ANALYSIS
 - Statistics, Predictions

APPLICATION

- Manpower
- Tools, Supplies, Hybrids

THE REMOTE SENSING PROCESS



RS SATELLITES

- REMOTE SENSING MEANS OBSERVING SOMETHING FROM A DISTANCE
 - Space SAT Observe Earth to Study
 - Large Tracts of Land
 - How Land Changes Over Time
 - Optical RS SAT use Reflected Light
 - Detect Electromagnetic Energy on the Earth's Surface



WHAT SAT. REVEAL GRAPHIC INFO SYSTEM MAPPING

- VEGETATION
- PROTECTED ACCESS
 - MEDICINAL PLANTS
 - ANIMALS, FISH, BIRDS, INSECTS
- LAND, SOIL
- WATER
- HISTORIC, ARCHAEOLOGICAL
- CONFIDENTIAL LAYER
- METAPHYSICAL PROPERTIES
 - RIVER FLOW, LAKE, DRAINAGE, SHADINGS



CASE IN POINT KUYAOYAO, PHILLIPPINES

- TOWN OF KUYAOYAO IN PROVINCE OF QUEZON ALMOST WHERE CALABRAZON AND BIKOL BORDERS
 - Little Outside Resources
 - Cannot Speculate Production
 - Few Tools to Maximize Resources
 - Hidden in Fragile Eco Sensitive Jungles
 - Small population Remained Invisible on a Regional Stage



LIMITED EXTERNAL SUPPORT KUYAOYAO'S SURVIVAL

- Nearby Towns such as
 - Madlandongan
 - San Lorenzo
 - Pinalandungan.
- NESTED IN JUNGLES
 - Surrounded
 - Waterways
- MAJOR TOWNS
 - Calauag
 - Lucerna
 - San Pablo
 - Lipa
 - Calamba.



NON PROFIT INVOLVEMENT

- NON PROFIT INVOLVEMENT
 - Enhance A Village
- GOVERNMENT PROGRAMS
 - VP Leni Robredo
- FOR PROFIT INVOLVEMENTS







KUYAOYAO INFORMATION LIVING TODAY

MEAGER POPULATION

- Produces Fish
- Coconut
- Sugar Cane
- Livestock
 - Pigs, Oxen, Cows, Chickens, Sheep
- Cultivate
 - Rice

MAINTAIN ENDANGERED

- Mangrove Trees
- Coral Reefs / Diving



KUYAOYAO INFORMATION LIVING TODAY

- SHACKS AND HUTS
 - Connected by Trails
 - Unrecorded
- WETLANDS, COCONUT TREES, TUNDRA
 - Rolling Terrain
 - Dense and Humid
- EXTREME SEASONAL
 - Hurricane, Rains

In-Memory Computing

Scorching Dry Seasons



TECHNOLOGY TO EDGE SURVIVAL

GOALS

- Optimize Production
- Handle Infrastructure
- Maximize Workforce
- Community Library
- Housing



SYSTEMS FOR COLLECTING DATA

Collected Information

- SEASONAL FARMING YIELDS
 - ROI Trends
 - Comparative Analysis
 - Cost Trends
 - Environmental Impacts

MANPOWER / TOOLS

- Labor
- Tools
- Materials





AQUAPONICS

RAS "RECIRCULATION AQUACULTURE SYSTEM" FRESHWATER Cages Tanks SALT WATER Cages Tanks



AQUAPONICS

- YIELDS
 - Fish
 - Vegetation
 - Nutrients
- RAS
 - Recirculated Process
 - Information and Statistics Collected
 - Measures track Nitrates / Bacteria
 - Solar Energy Runs Pump





PRODUCTION DEVICES EASE YIELDS

Vegetation

- Coconuts
 - Productivity Levels Based on Height of Coconut Tree
 - Production on Collection
- Fruits
 - Organics
 - Spoil vs. takes
- Rice
 - Seasonal
 - Collection Ease



GREEN HOUSE CONTROLLED ENVIRONMENT

FISH NUTRIENTS / HATCHERIES

- Vegetables
- Fruits
- Hybrids
 - Splice
 - GMO / Heirloom

INSECTS

- Entomology
- Insecticides Studies

CONTROLLED CHEMICAL RELEASES

Distillation

OUTSIDE EFFORTS TO MAX OUTPUT

NON PROFIT W/ BOARD MEMBERS

- Advisory Help / AWARENESS
- Consultants
- Evaluated Performance
 - Data Collection
 - Data Distribution
 - Displayed on variety of Platforms / Devices
- EMPHASIS TO IMPROVE EXPECTATIONS
 - Bring Rural Villages to a World's Stage





OPPORTUNITIES FOR SMART VILLAGES

Figure 1.3: Global patterns of urbanization, 2015

Source: Resed on United Nations, 2014b.

UN STATES

- 380,000 Rural Villages Worldwide
- 3.8 Billion Villagers with an Increase of 404 million by 2050
- Might Peak by 2020 and then Decrease Heavily





MOST RURAL VILLAGE

Unmapped Uncharted Paths, Structures, Water Sources, Food Sources. Potential Lost Revenues Subject to **Exploitation Political Anguish** Environmental Devastation **SMART**

(ILLAGE)

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COLLECTIONS OF INFORMATION





COLLECTIONS OF INFORMATION



In-Memory Computing 2017



MAPPING BACKGROUND / OVERLAY



Bing

DEVICES TO COLLECT INFORMATION

- Edit with ID
 - Basic Draw Tools Style
- Edit with Potlatch2
 - Advanced Draw Tools Style
- Edit with Remote Control
 - (JOSM or Merkaator)
 - Smart Phone
 - Garvin Devices
- OVERLAYS



GPS RESULTS

3D TERRAIN CREATED

- Data Gets Mapped to a 3d Model
- Changes / Comparisons
- Statistics Reveals Bottom Line Survival.
- Offer Rich Content, Display Layers, Define Boundrys



RAISING QUESTIONS FOR THE FUTURE

SMART EVACUATION CENTER

- Live Feed / Physical Response Data
- Community Accountability Response
- Medical Records and Library

SATELLITE MONITOR CENTER

WEATHER STATION

Radio Tower

EMERGENCY RESPONSE

Active Data Collection Center



KUYAOYAO AIMS TO BE SMART VILLAGE

SMART VILLAGES

- MULTIFAMILY SHELTERS
 - Leeds
 - Humanitarian
 - New Build Technologies
- MARINA AND DIVE KIOSK
 - Predict Tides
 - Sea Life Information
 - Ocean Conditions
 - Lunar Phases
- RETAIL / VISITOR CENTER
 - Attract Eco Tourisms





EXAMPLES BUSINESSES THAT USE TECHNICAL ADVANTAGES

- EXAMPLES OF BUSINESSES THAT PRODUCE ADVANTAGES
- WATER AMBASSADORS OF CANADA
 - Assist Programs
 - Interchangeable Wells
- BLUME DISTILLARIES
 - Ethanol
 - Alcohol Stoves
 - Scalable Off Grid Distillation
- GARVIN GPS
 - Devices for Map Making





CLEARLY SEE KEY ADVANTAGE IMDB HIGH SPEED MEMORY

SOPHISTICATED DATA COMPRESSION

- To Store Data in Random Access Memory
- IMDB Performance is 10,000 times faster
 - When Compared to Standard Disks
- Allows Companies to Analyze Data
 - SECONDS VS LONG HOURS
- Helps with Critical Decisions
 - Natural or Long term issues.



CACHE, STORE, PROCESS DATA

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ADVANTAGES OF IN_MEMORY COMPUTING FOR RURAL VILLAGES

- CACHE Massive Data Live
- SEARCH Ensures Fast Response Times
- STORE SESSION DATA & Custom Live Sessions
- OPTIMIZE Website Performance W/ Improved Complex Event Processing Low Lag in 3d Displays



IN-MEMORY RURAL VILLAGES ADV

CACHE DATA

- Retail, Banks Farming, Deliveries
- SEARCH RESPONSE
 - Expectations, Personal, Contracts
- STORE DATA & LIVE SESSIONS
 - Chat, Live Video, Materials, Change orders
 - AI, AR
- OPTIMIZE EVENT PROCESSING 3D DISPLAYS
 - Virtual Presentations



CONCLUSION

INVISIBLE POPULATIONS APPEAR

- Era of Technology to Improve Standard of Living
- Win-Win for VC, Corporations, Non Profits Maxing Solutions
- Maximize Earth Resources
- Reduce Waste on a Global Level





WHAT NEXT?

BE INVOLVED

- UN Climate Change
- Non-Profits are Severely Overwhelmed (.org)
- Bring Infrastructure / Technology
- Work with your Company to Sponsor Assistance

SUPPORT

- Experimental Student Exchange
- Student Research





THANK YOU





REFERENCES

Index of References

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