



Environment Computing at HCMUT - Vietnam

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Contents

- What we do
- Activities





Motivation

- HCM city
 - Big plan for Smart city
 - Problems
 - (1) Traffic jam
 - (2) Urban flooding
 - (3) Pollution: waster & air
- Mekong delta
 - Flooding
 - Salinization
 - Healthy

Traffic in HCMC

■ Big data

- Motorbike: 5M
- Car: 5K
- 3.800 roads with the total length of 3.670km
- Realtime

■ Complexity

- Many motorbike
- Safety space
- Traffic coming from small routes



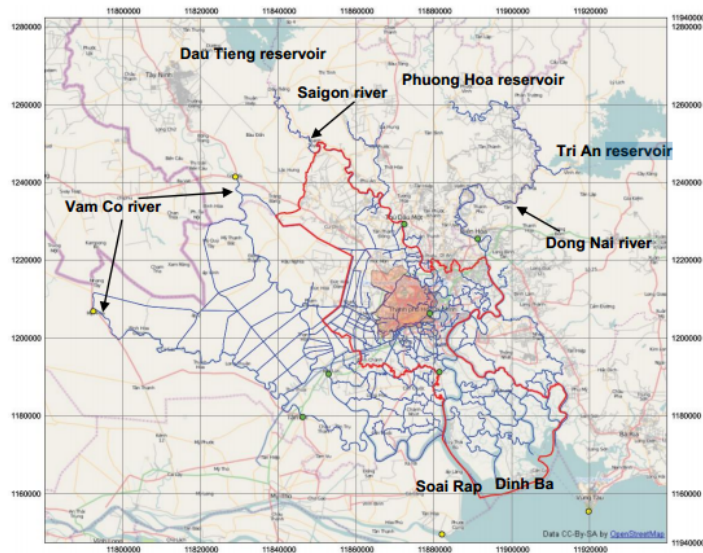
Urban flooding in HCMC



Street or River?



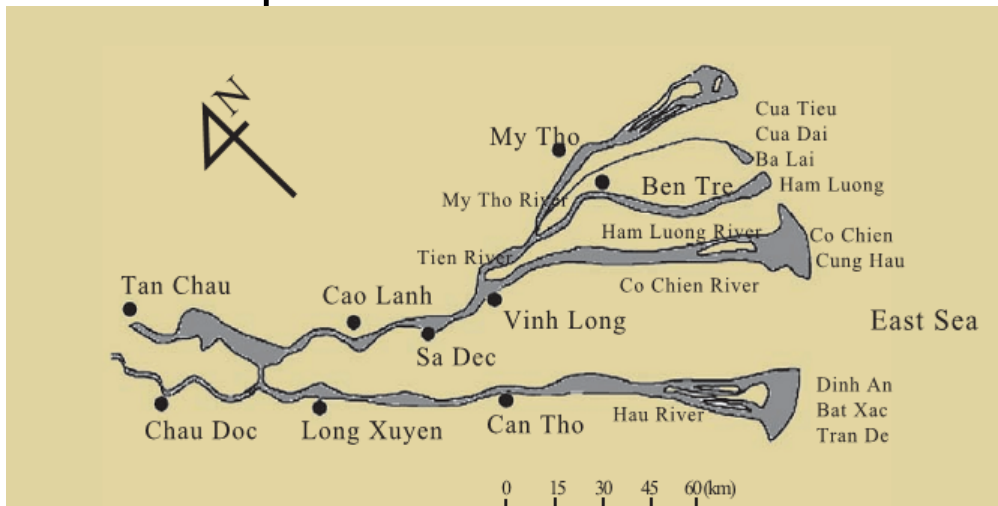
Airport?



Safety?

Problems in Mekong Delta

- Flooding
- Salinization
- Bank erosion
- Navigation hazards
- Pets
- Invasive exotic plants
- Healthy risks: water-borne, skin, mosquito-borne diseases



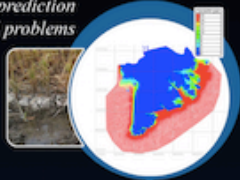


Activities at HCMUT



SALINIZATION IN MEKONG DELTA
Simulation and prediction for environmental problems

AUTOMATIC MOTORBIKE DETECTION IN VIETNAM
Automatic traffic density estimation in Ho Chi Minh city



ITS HCMUT
Traffic information for Ho Chi Minh city

Internet & Cloud Services

LIBRARIES	
ANSYS (128 cores)	HADOOP & SPARK
CADENCE	OpenTEMAC
OpenFOAM	Intel Parallel Studio
BLAS	...

INTEL XEON PHI (MIC) CO-PROCESSOR



2 MIC CARDS/NODE
61 CORES/CARD

SUPERNODE-XP & HPC APPLICATIONS

INFINIBAND SWITCHES
56 (GBPS)



PCIe WIDTH - x16
SPEED - 5 GT/s



S-Island

12 COMPUTE NODES

M-Island

8 COMPUTE NODES

L-Island

4 COMPUTE NODES

24 CORES/NODE
128 GB RAM

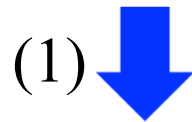
24 CORES/NODE
256 GB RAM + SSD

24 CORES/NODE
512 GB RAM +SSD

HCMUT CoLab

- (1) Smart Cities
- (2) Industry 4.0

Real problems



Traffic jam, Urban flooding
Pollution: air & water
Smart light, Robotics



Smart
Cities

Pelab

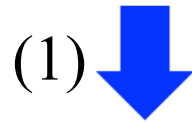
Bio-
medical

Material

...

Joint/new Labs

Applications,
Solutions,
Products



Core Lab – Joint/new Labs

Cyber
Security

AI

Big Data

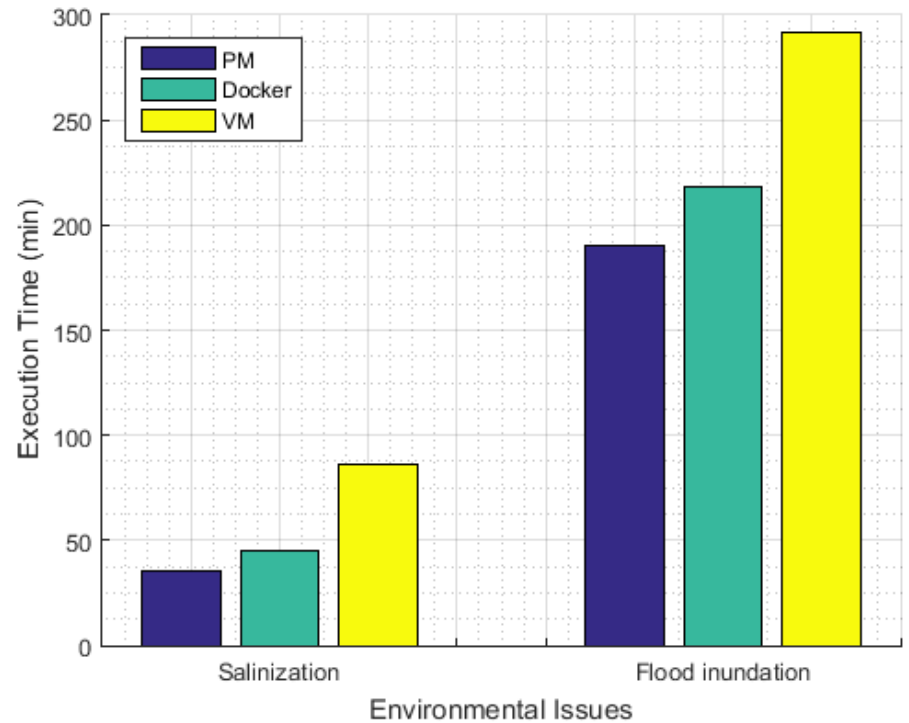
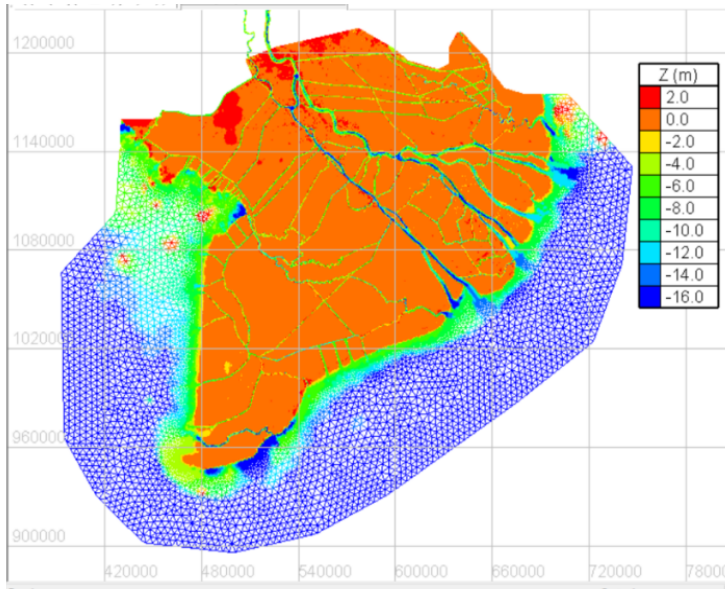
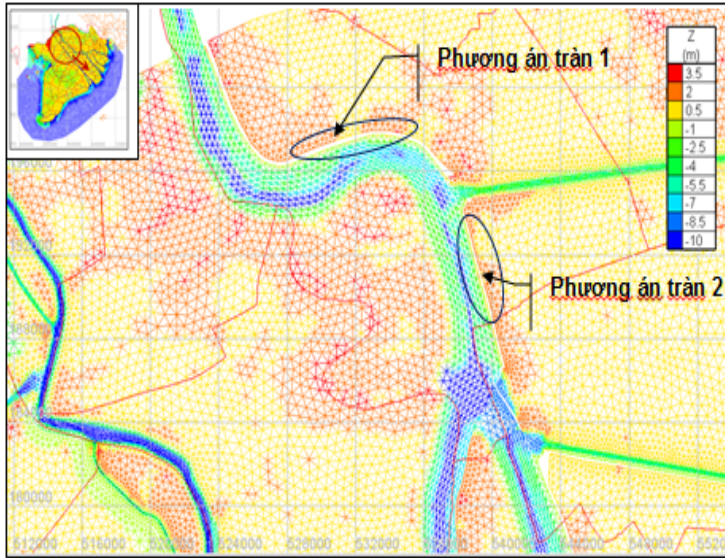
IoT

Block-
chain

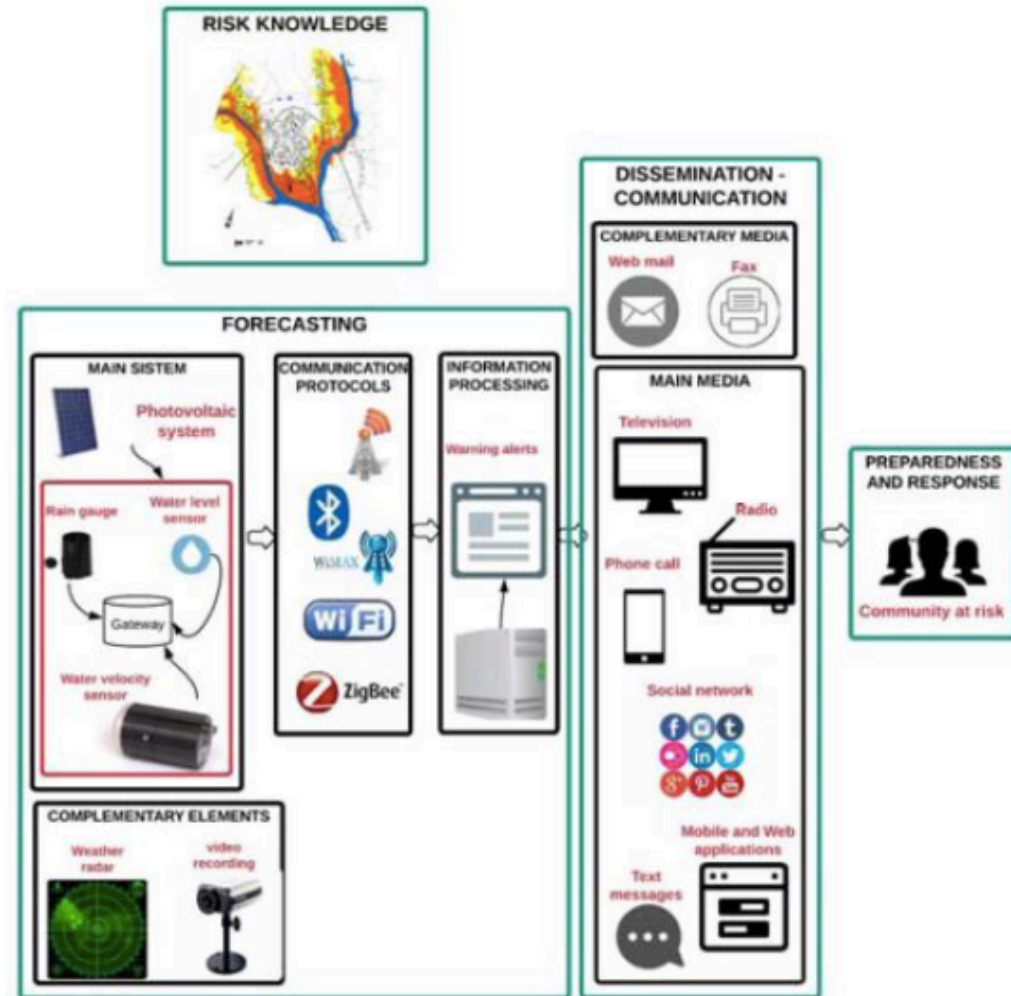
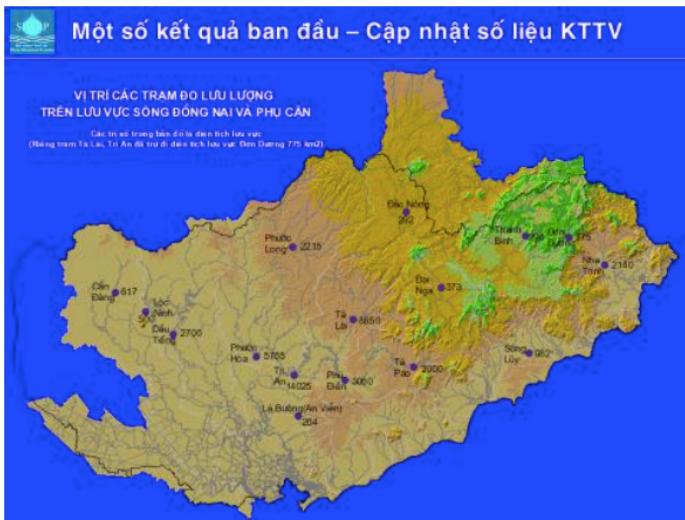
HPC Lab


Computing & Data
Infrastructure &
Core Technologies

Real data of Mekong Delta



Flood real-time model for HCMC: monitoring and warning system





Smart villages (1)

- Building on existing strengths and assets as well as on developing new opportunities
- Quality of life
- Promotion of local products
- Building based on technologies: ICT

Smart villages pilot project

- Clubhouse model in Mekong Delta
 - Dong Thap province
 - Main product: Mango
- Environment problems





Citizen (apps)

Mango brand

Companies

Smart village portal

Clubhouse ecosystem (Mango)

Comm (LoRa Wan, GSM)

Smart meters

Water monitoring system

Data analytics

Smart light system

Smart irrigation system

Data core

Smart camera system

Government data core

Smart Cities Dong Thap



Environment problems

- Salinization
 - Monitoring
 - Analytics
- Quality of water
 - Monitoring
 - Analytics
- Weather & typhoon forecast



Summary

- Smart cities/villages
 - Environmental problems are big problems
 - Monitoring & analytics => prediction
- Applications
 - Flood real-time model for HCMC
 - Smart villages pilot project in Mekong delta



Thank you!

More information:

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