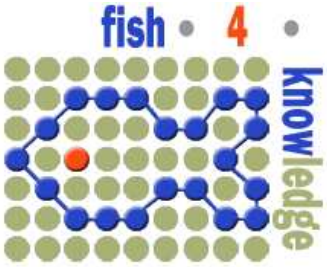


Fish4Knowledge Deliverable D7.8

Second 6-monthly report to EC

Principal Author: UEDIN
Contributors: All partners
Dissemination: PU

Abstract: This document summarises the project activities in months 13-18.

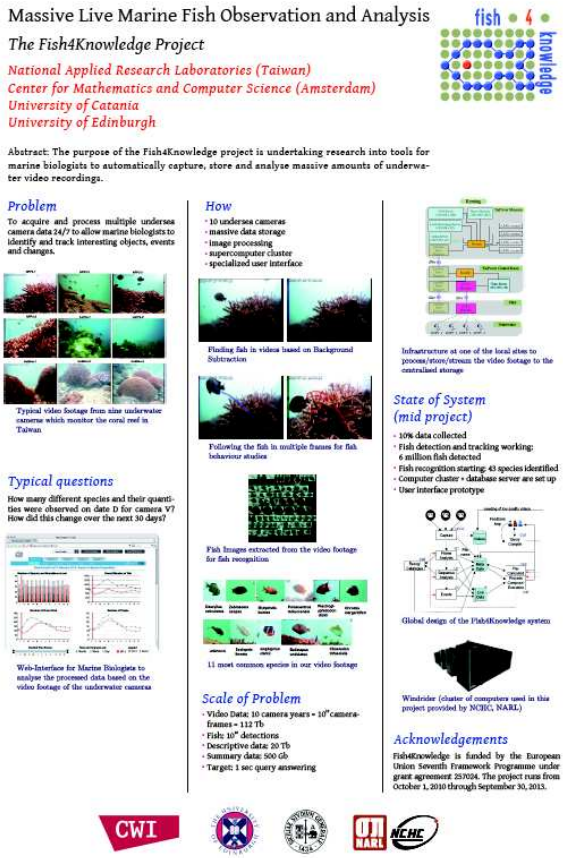
Deliverable due: Month 18

1 Administrative Progress

The main administrative activities were 2 project consortium meetings December 12-13, 2011 (Catania) and April 26-27, 2012 (Amsterdam). Minutes and PDFs of all meeting presentations are available on the project “Members Only” pages. The main administrative topics were the overview of the technical achievements and associated deliverables. Several technical working meetings were planned. The core technical goals of the December meeting were: Status and Access to Scientific Cluster, Status of SQL on Scientific Cluster machines, Mass data storage, User Interface : Database linkage and Integration planning. The core technical goals of the April meeting were similar as these are the issues that link the various components together.

The project web site has been updated with recent publications and deliverables.

A poster has been developed for use at Int. Supercomputing Conf., Hamburg, June 17-21, 2012, which gives an overview of the project:



A presentation was made at ”The Ocean of Tomorrow 2013” in Brussels on 6 June 2012, with the hope of engaging potential partners for future projects.

A Memorandum of Understanding between Catania and the Caribbean Aquacam Research Programme regarding joint PhD students has been signed.

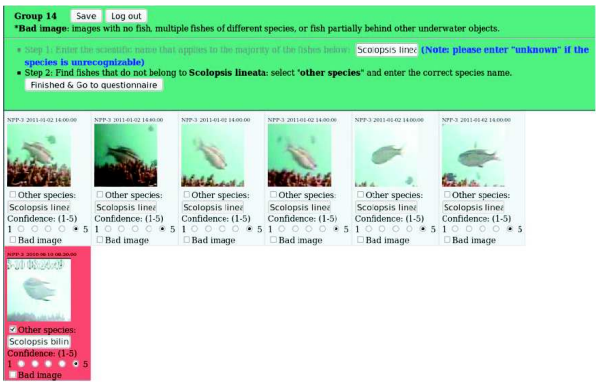
There is about a 3 month delay in project progress as a consequence of the rate at which the research staff were hired.

2 Technical Progress

This section summarises the progress made by each of the different teams during project months 12-18.

2.1 CWI team achievements

- Published the “User Information Needs” based on interviews with a number of domain experts.
- Developed plans for answering the different types of expert queries.
- Have developed a first prototype of the UI which focuses on visualisation of the expert’s fish counting questions.
- Developed a tool for helping determine the true fish species by fusing multiple expert opinions:



- Have been developing a process for reporting the uncertainty associated with fish counting tasks, based on the uncertainties that arise from the image analysis modules.

2.2 NARL team achievements

- NARL has the main project machine (48 cores) up and running with a virtual machine execution environment for users.
- Additional NAS memory has been added for video and database storage, now 49 TB.
- NARL has been exploring different SQL options for use on the machine.
- c. 7000 hours video have been captured and stored.

2.3 UCATANIA team achievements

- A new detection algorithm w/background model using observed pixel values, exploiting intraframe properties and a probabilistic approach to evaluate tracking uncertainty. Results in a detection rate of about 75% with a 9% false alarm rate. Performance evaluation has been made on higher resolution videos (640x480).

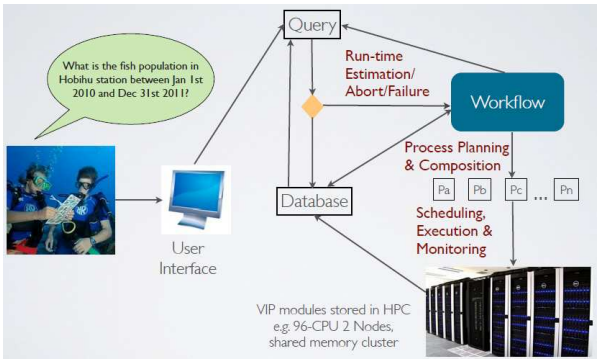
- Improved automatic detected fish contours and also contour ground truthing by combining user annotations.
- Web-based detection ground truth and performance evaluation tool

plus the Fish game: tracking and recognition ground truth labelling, and a voting algorithm to combine multiple user annotations.

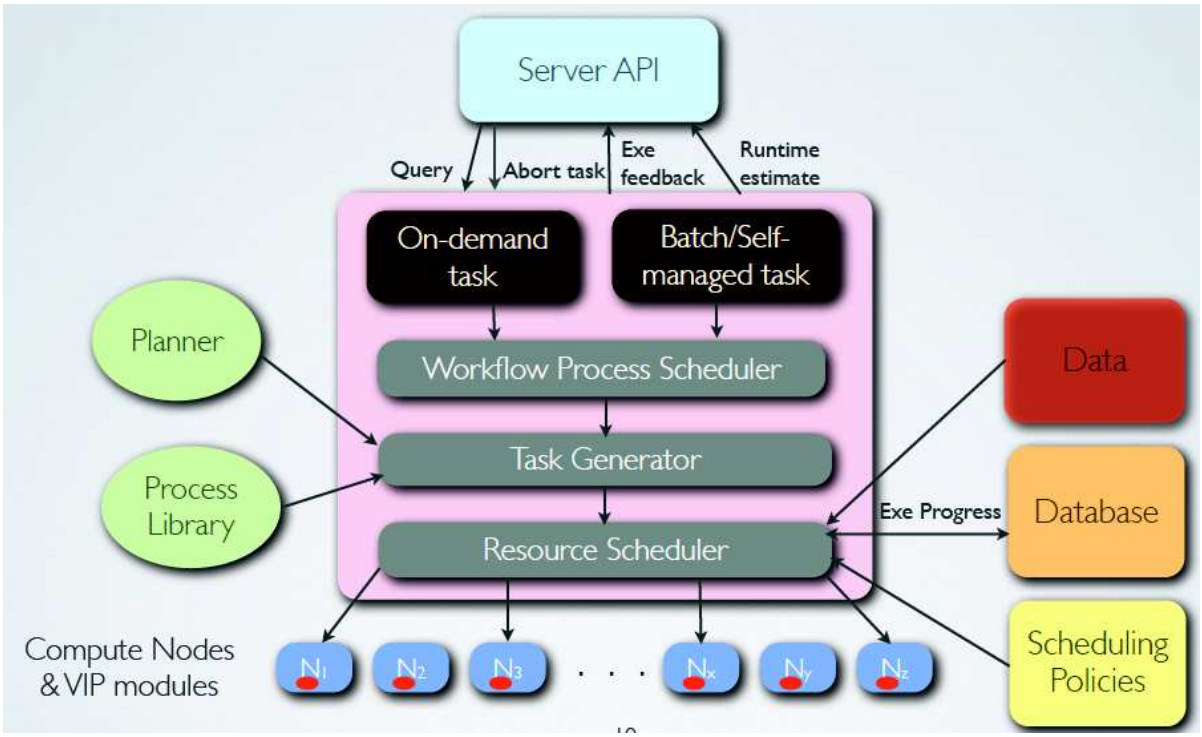
- Filling out database: processed 471 hours video, 3,869,473 detections, 456,622 tracked fish.
- Fish trajectories representation and clustering and anomalous Fish Trajectories Detection by means of HMMs.
- Co-organisation of VIGTA 2012 workshop and a special journal issue on “Methods and Tools for Ground Truth Collection in Multimedia Applications” in the journal Multimedia Tools and Applications.

2.4 UEDIN workflow team achievements

- Ontologies for video description, capabilities, goals
- Designing workflow composition and execution



- Second Life building 'finished'
- Installed Sun Grid Engine (SGE) resource scheduler on Taiwanese VM.
- Designed workflow process management architecture:

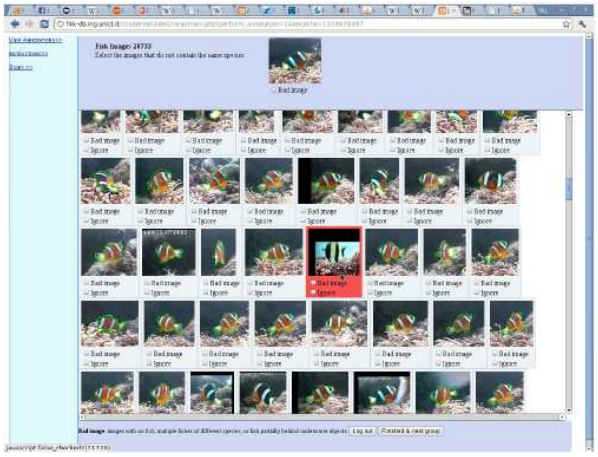


- Started implementation of baseline workflow composition engine.
- Organising an Intelligent workflow workshop at KES AMSTA, to be held in June 2012.

2.5 UEDIN vision team achievements

- Properties (66+) have been extracted from the fish detections, to be used for clustering and recognition.
- Hierarchical classification for the most common fish species (c. 90% correctness for 3179 fish, 479 tracks, 10 species)
- Large scale fish clustering method, testing on 100,000 fish.

- Improved groundtruth annotation using clustering: dataset of 10000+ fish, 43 species, c. 98% consistent labels after 6 users. Here s a snapshot of the groundtruthing tool:



- First version of fish recognition and clustering components running in Taiwan.
- A design for query database parallelisation.
- Literature study into recent studies of fish behaviour understanding and a preliminary filtering mechanism for normal fish trajectories.

3 Plan for technical working meetings

We have identified a number of technical working meetings that are to take place.

- UEDIN (workflow) + NCHC : integration architecture, database, process control
- UCAT+UEDIN(VISION)+CWI: Groundtruth and Certainty Representation
- NCHC + UCATANIA + CWI + UEDIN workflow: HPC workflow
- NCHC + CWI: HPC query interfacing
- ALL: integration and testing

4 Deliverable Summary

Below is a summary of the deliverables that are due since the first annual review.

Most are approaching completion, but have been delayed by about 3 months due to the lag in recruitment of the project researchers.

Each deliverable document, dataset and software component now has an identified person from another project partner who is responsible for reviewing the content and performance of the deliverable. The Quality Control person is identified in the table below.

Num	Team	Title	Mth	Done	QC
D2.2	CWI	Identified user scenarios and impl plan & UI design	6	Y	Jessica
D4.1 D6.1b	NCHC	Video and RDF store, plus access	12	Y	Bas
D4.2	NCHC	Workflow platform	12	Y	Concetto Jessica
D7.11	UEDIN	Second annual public report	14	Y	all
D2.3	CWI	Component based prototypes + evaluation criteria	15		Bas
D1.2	UCTAN	Fish and environment property description	18		Bas
D3.2	UEDIN	Process planning and composition	18	Y	Bas
D7.8	UEDIN	Second 6-monthly report to EC	18	Y	all

5 Publications since year 1 report

1. C. Spampinato, A. Faro, S. Palazzo, “Event Detection in Crowds of People by Integrating Chaos and Lagrangian Particle Dynamics”, Proc. 3rd Int. Conf. on Information and Multimedia Technology (ICIMT 2011), Dubai, UAE, December 28-30, 2011.

2. S. Palazzo, C. Spampinato, “Object Tracking: State of the Art and Online Performance Evaluation”, Proc. IEEE Int. Conf. on Computer and Management (CAMAN 2012), Wuhan, China, March 9-11, 2012.

3. Jiyin He, Maarten de Rijke, Merlijn Sevenster, R. van Ommering, and Yuchen Qian. Generating Links to Background Knowledge: A Case Study Using Narrative Radiology Reports, 20th ACM Conference on Information and Knowledge Management (CIKM 2011), pp. 1867-1876, Glasgow, ACM, October, 2011.

4. Jiyin He, Marc Bron and Maarten de Rijke. A Query Performance Analysis for Result Diversification, ICTIR ’11: 3rd International Conference on the Theory of Information Retrieval, pp. 351-355, Sep. 2011.

5. Vera Hollink, Jiyin He, and Arjen P. de Vries. Explaining query modifications: an alternative interpretation of term addition and removal To appear in: Proceedings of the 34th European Conference on Information Retrieval (ECIR’12), Barcelona, Spain, 2012.

6. C. Spampinato, S. Palazzo, D. Giordano, I. Kavasidis, F-P Lin, Y-T Lin, Covariance Based Fish Tracking In Real-Life Underwater Environment, Proceedings of the International Conference on Computer Vision Theory and Applications - VISAPP 2012, Rome, Italy, 2012.

7. Y.H. Shiau, F.P. Lin, S.I. Lin and C.C. Chen, Real-Time Fish Observation and Fish Category Database Construction, Int. Journal of Advanced Computer Science and Applications (IJACSA), 2012 (accepted).

8. C. Spampinato, S. Palazzo, B. Boom, J. van Ossenbruggen, I. Kavasidis, R. Di Salvo, F.-P. Lin, D. Giordano, L. Hardman, R. B. Fisher, “Understanding Fish Behavior during

Typhoon Events in Real-Life Underwater Environments", Multimedia Tools and Applications, online 2012.

9. S. Theis, Comparing efficiency and cognitive load of uncertain data visualizations, Thesis Master Information Studies, Universiteit van Amsterdam, July 2011.

10. I. Kavasidis, S. Palazzo, R. Di Salvo, D. Giordano, C. Spampinato, "A Semi-automatic Tool for Detection and Tracking Ground Truth Generation in Videos", Proc. First Int. Workshop on Visual Interfaces for Ground Truth Collection in Computer Vision Applications, Capri, May 2012.

11. C. Spampinato, S. Palazzo, D. Giordano, "Evaluation of Tracking Algorithm Performance without Ground-Truth Data", Proc. Int. Conf. on Image Proc. (ICIP), 2012, to appear.

12. G. Nadarajan, Y.-H. Chen-Burger. "Goal, Video Description and Capability Ontologies for Fish4Knowledge Domain". Special Session on Intelligent Workflow, Cloud Computing and Systems, KES-AMSTA 12, Croatia, June 2012.

