

NOTES ABOUT THE NGCUV'12 OPEN DISCUSSION SESSION “THREE QUESTIONS”

Kanna Rajan, (Monterey Bay Aquarium Research Institute)
Rafael Garcia and Pere Ridao (University of Girona)

The ‘Open discussion Session’ was held on April 11th. It was a plenary session structured around “Three questions” proposed by the session chairs to foster debate and informal discussion among the workshop participants. The aim of these notes is to reflect the contents of the discussion. The notes try to reflect what was discussed, not who said what.

Q1: How can we do interdisciplinary science?

How should we promote the cooperation among the marine robotics community and marine scientists, underwater archaeologists, oceanographers, ...?

Some initiatives are already ongoing such as the “Breaking the Surface” event (<http://bts.fer.hr/>), which was introduced by one of the participants at NGCUV who is organizing this activity this year:

- ***Breaking the Surface (BTS):*** *The “International Interdisciplinary Field Training of Marine Robotics and Applications” BTS, is a sort of summer school including field training in marine technology with applications to marine science, maritime archaeology and security. The event brings together people from different communities, which lecture each other in their respective areas of expertise. It also promotes engineering experiments to face real applications of interest for the non-engineering disciplines. The event, which started as a student initiative, already has 3 years of successful experience. It was promoted by the engineering community, with the interest of gathering ideas about real problems, which need to be solved.*

It was also pointed out how important is to instill respect amongst the different communities (engineers, archaeologist,...) involved especially since each community has things to learn from others. For instance, we have to teach a scientist that cameras need to be calibrated prior to a survey, and probably in-turn have to learn other things which may sound to them as obvious, as this one is for us. Hence, respect is very important if we want to face inter-disciplinary projects.

Although there have been a few initiatives doing inter-disciplinary science like BTS, the FRESSUBNET (<http://auvac.org/people-organizations/view/313>) Azores Workshop or the 2011 Cartagena AUV experiment in Mar Menor (<https://sites.google.com/site/auvexperiment2011/>), the reality is that this is still too few to have an impact. Joint cruises and joint publications also play an important role in fostering such collaborations.

In Portugal, for instance, there is also the “Associated Laboratory LARSyS” inter-disciplinary group. At NGCUV we were told that they are evaluated not only at each discipline level, but also in terms of joint results and publications.

Two funding agencies representatives (ONR Global and the Portuguese EU/FP7 representative) were present in the session. In their view, they would like to see more

and more inter-disciplinary projects. The EU/FP7 representative, pointed out three things considered important by the commission:

1. The lobby effect. In the EU this is can be achieved participating within the robotic platforms. Therefore, there is a need to bring marine robotics inside these platforms.
2. A Web Portal is needed. Probably a Coordinated And Support action would be useful to bring together engineers and end users.
3. One of the issues not covered by any paper in the conference, which is seen as very important is the “Early Tsunami Warning Systems”. There are apparently plenty of opportunities on this topic).

A participant, from the industry sector, explained the experience of the Nuclear industry which is promoting inter-disciplinary science, asking PhD. students to work in at least two disciplines.

It was also pointed out that probably the researchers are only attending the conference related to their own disciplines. We were encouraged to start attending events in other disciplines.

An academic participant suggested that, inter-disciplinary is more difficult now because the university degrees devote less effort to the fundamental areas (physics, mathematics...), which used to be stronger in the past. This probably has an impact, resulting in consequent production of more students with a 'stove-piped' view of the world.

EU tools that can play an important role to foster this cooperation among heterogeneous disciplines include Initial Training Networks and Networks of Excellence.

Q2 How do we foster Entrepreneurship? Or why Silicon Valley is in California?

A representative of a Spin-off company explains his experience. Graaltech, was created to provide a working opportunity for young Phds, who were trained in academia, but finding it difficult to become part of the university's academic staff.

In the USA, most of the students fund themselves. This means that they are responsible from a very early stage for their careers and actions. This has a likely impact on the entrepreneurship capability of such students.

In some countries (like Brazil) things are changing. For instance in the oil industry, which has been using ROVs (and still use), the focus is changing and there is more interest for AUVs. It is important to be aware about how things change and be ready for the changes.

Some of the participants think that Venture Capital may be one of the big differences. And that it is endemic to the culture where risk taking is encouraged; it was felt that in Europe, such a spirit is in short supply.

In other countries (Croatia for instance), there is no capital available and hence it is difficult to start companies. Probably, people have also to change their minds vis-a-vis risk and how to share risk. It is likely better to have the 6% of something great, than

100% of nothing. Moreover, in some countries there is no a clear legislation for the creation of university spin-offs. And hence Intellectual Property issues make start-ups a hard task.

Another participant suggested that entrepreneurship in marine robotics will likely come from where the money is. Nowadays, these are in the oil and offshore industry.

Q3 Do we need a “Grand Challenge”?

DARPA Grand Challenge has had a great impact in the research in the autonomous guidance of cars. Moreover, few years later some of the pioneering teams are cooperating with industries further developing the technology. Do we need a grand challenge to foster the research and development of the marine robotics technology?

https://www.fbo.gov/index?s=opportunity&mode=form&id=ee8e770bcfe1fe217472342c67d6bd5a&tab=core&_cvi_ew=0

One of the participants explained that an X-Prize for marine science and engineering is in the process of being prepared. After a bit of web search, this link provides some info about it (http://nextprize.xprize.org/2012/04/robots-of-sea.html?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+nextprizeblog+%28next+PRIZE+Blog%29)

Hereafter some of the thoughts from the audience are listed:

- Arctic Exploration
- It would be important to include energy management.
- It should face a problem with a great impact on society.
- Grand challenge does not mean an extremely expensive robot, could mean to try to do a big thing with a very low cost robot.
- Probably something like when the 1st glider crossed the Atlantic could be viewed as a grand Challenge.

Unfortunately at that time, we run out of time and the bus for the conference banquet was waiting for us. It is time to close the session and run to enjoy some Porto wine to get more inspired for another time ;-).