

# **International Association for Pattern Recognition**

## **TC 20 Annual Report August 2013**

### **1. IAPR TC-20 Objectives**

The goal of the IAPR TC-20 is to bring together pattern recognition scientists and life scientists to find solutions to problems in bioinformatics, and foster multidisciplinary research in the pattern recognition community. The principal objective of the IAPR TC-20 is to facilitate the interactions between pattern recognition and life sciences communities to interact through its memberships and associate memberships, thereby to match-make pattern recognition techniques and bioinformatics and bio-medical applications. The committee has a membership list and maintains a website for the exchange and dissemination of ideas among its members. In order to achieve its main goal, the IAPR TC-20 will expand its activities in the following areas:

- a. Education: through the website, educational materials such as lecture notes, tutorials, etc., will be made available.
- b. Research: a database of bioinformatics applications, literature, tools, and benchmark datasets will be maintained.
- c. Events: organize PRIB conferences and TC-20 special sessions and tutorials at conferences, edit special issues of journals, and organize competitions, to name just a few.

### **2. IAPR TC-20 Background**

In the post-genomic era, a holistic understanding of biological systems and processes, in all their complexity, is critical in comprehending nature's choreography of life. As a result, bioinformatics involving its two main disciplines, namely the life sciences and the computational sciences, is fast becoming a very promising multidisciplinary research field. With the ever increasing application of large-scale high-throughput technologies, such as gene or protein microarrays and mass spectrometry methods, the enormous body of information is growing rapidly. Bioinformaticians are posed with a large number of difficult problems to solve, arising not only due to the complexities in acquiring the molecular information but also due to the size and nature of the generated data sets and/or the limitations of the algorithms required for analyzing this data. Although the field of bioinformatics is still in its embryonic stage, the recent advancements in computational and information-theoretic techniques are enabling us to conduct various in silico testing and screening of many lab-based experiments before these are actually performed

in vitro or in vivo. These in silico investigations are providing new insights for interpretation and establishing new direction for a deeper understanding. Amongst the various advanced computational methods currently being applied to such studies, the pattern recognition techniques are mostly found to be at the core of the whole discovery process for apprehending the underlying biological knowledge. Thus, we can safely surmise that the ongoing bioinformatics revolution may, in future, inevitably play a major role in many aspects of medical practice, and/or the discipline of life sciences.

Bioinformatics is aimed at discovering knowledge from life sciences data with the aid of Information Technology, to find answers to unresolved problems in biology. One of the important discoveries of pattern recognition in bioinformatics is that specific patterns of our genomes and proteomes are able to tell our characters and how prone we are for certain diseases. In the coming years, medical practitioners will be able to personalize our medication by just looking at these patterns.

### **3. IAPR TC-20 Activities in Last 6 months**

1. A new TC-20 vice-chair has been nominated this year: Dr. Alioune Ngom.
2. TC20 tried to increase the number of its members, as suggested by the ExCo at the biannual TC meeting in 2012. Recently, about 100 new members joined our TC, and hence, TC-20 currently has more than 130 members.
3. The main activity organized by the IAPR TC-20 members was the Pattern Recognition in Bioinformatics (PRIB) conference. TC-20 initiated PRIB as a workshop in 2006 which has subsequently been upgraded to a conference since 2008.
4. This year, the PRIB 2013 conference was organized in Nice (France) on June 17 to 20. We co-organize it with the International Meeting on Computational Intelligence Methods for Bioinformatics and Biostatistics (CIBB 2013, June 20-22), such that we shared the same social events. PRIB had invited 3 Keynote Speakers (Drs Ram Samudrala, Jean-Phillipe Vert, and Dr. Anne Siegel) who gave exciting and interesting 1-hour presentation each, in 3 different days. One of the keynote speakers (Anne Siegel) was shared with the CIBB conference. Dr. Elena Marchiori had also organized a special session entitled "Computational diagnosis and health informatics". There were also few poster presentations.
5. PRIB 2013 Statistics: We have obtained the following stats:
  1. Numbers of submissions: 43
  2. Number of accepted papers: 26
  3. Number of accepted as posters: 15

#### **4. Plans (timeline until ICPR2014 and beyond)**

##### Website updates

Educational information: include more pointers to educational information.

Tutorials: include pointers to material and videos.

Description of application areas: keep the description updated.

Examples of successful projects: stimulate TC20 members to include interesting information and material about successful projects.

Demos: include more pointers to demos. Reference resources (datasets, evaluation tools): expand and keep the list of reference resources updated.

##### Activities

Events: organize PRIB 2014 and increase the number of submissions and of attendees; organize summer schools and related research events.

Publicity: Stimulate researchers and practitioners potentially interested in TC-20 activities to become members.

##### Other

We will nominate new TC-20 information and web master chair, as well as a new TC-20 chair.