

Interim Report of Recent Activities of TC-20 and its Members

(Home Page: <http://cs.uwindsor.ca/iapr/>)

Report prepared by:

Madhu Chetty on 30 June 2009

- a. Organisation of PRIB 2010 at University of Sheffield, UK
 - See details of conference organisation in Appendix A. A TC20 meeting is planned during the conference to discuss on increasing the committee activities in future.
- b. Special Issues
 - Special Issue on “Pattern Discovery from Bioinformatics Data”, IEEE Engineering in Medicine and Biology Magazine. will appear as July/August Issue of in 2009 (Guest Editor: Jagath Rajapakse)
 - Special Issue on “Pattern Recognition in Bioinformatics”, *Pattern Recognition Letters*. In process. Extended selected articles from PRIB 08 are undergoing review. Issue planned to appear in late 2010 (Guest editors: Madhu Chetty, Shandar Ahmed and Bertil Schmidt)
 - Special Issue on “Bio-inspired methods in Bioinformatics”, *Neurocomputing Journal* . In process. Extended selected articles are undergoing review. Issue planned to appear in early 2010 (Guest editors: Madhu Chetty, Alioune Ngom and Elena Marchiori).
- c. Edited PRIB 2008 Conference Proceedings:
 - Chetty M., Ngom A. and Shandar A. (Eds) 2008, Pattern Recognition in Bioinformatics, Book Series: Lecture Notes in Computer Science, Subseries: Lecture Notes in Bioinformatics, Conference proceedings for Third IAPR International Conference, PRIB 2008, Melbourne, Australia, October 15-17, 2008., Vol. LNBI 5265, 472 pages, ISBN: 978-3-540-88434-7
 - Chetty M., Shandar A., Ngom A., Teng S. W. (Eds), 2008 Pattern Recognition in Bioinformatics, Supplementary PRIB’08 Conference proceedings, Melbourne, Australia, October 15-17, Publisher: PRIB 2008 ISBN: 978-0-7326-22268.

d. Leadership Board

On advise from Dr Apostolos Antonacopoulos, 1st Vice President of the IAPR, a “Leadership Board” was formed by TC-20 committee. Following are the LB members:

- Madhu Chetty- Chair (ex-officio IAPR TC-20 Chair)
- Raj Acharya – Vice Chair (ex-officio IAPR TC-20 Vice Chair)
- Jagath Rajapakse – Co-opted as ‘Senior Member’ (ex-officio, past TC20 chair, General chairs of PRIB 2006, PRIB 2007)
- Visakan Kadiramanathan – Co-opted as ‘Senior Member’ (ex-officio General Chair, PRIB 2009)
- Alioune Ngom – ‘Web Chair’
- Shandar Ahmed – ‘Information Chair’

e. Website updates:

- Web Chair has activated the website for TC20 committee at <http://cs.uwindsor.ca/iapr/> . All members will be requested to provide photos, short bio, homepage URL to be included in the TC-20 home page.
- The “Information Chair” is working on details to buy a domain name (such as www.iapr.bioinformatics.org) for the TC20 committee to provide a professional touch to the committee home page. If implemented, no other change to the current web site will be required.

f. Community engagement of TC20 members (Conference Organisation, Special Sessions, Tutorials, Editorial roles)

- Nikhil Pal: Editor-in-Chief, IEEE Trans. Fuzzy Systems
- Limsoon Wong : Conference chair, RECOMB2008.
- Limsoon Wong. Guilt by Association: A Tutorial on Data Mining Techniques for Protein Function Inference. Invited tutorial at IPM-NUS Workshop on Analysis and Application of Protein Interaction Networks, Shahih Behesti University, Tehran, 17-18 November 2008
- Limsoon Wong, Associate Editor, Bioinformatics.
- Limsoon Wong, Managing Editor, J. Bioinformatics and Computational Biology.
- Jagath Rajapakse: Associate Editor, IEEE Trans. on Computational Biology and Bioinformatics
- Associate Editor, IEEE Transactions on Medical Imaging
- Associate Editor, IEEE Transactions on Neural Networks
- Editorial Board, Advances in Bioinformatics
- Editorial Board, Neural Information Processing: Letters and Reviews

- Raj Acharya: Associate Editor, IEEE Trans. on Computational Biology and Bioinformatics
- Kay Wiese: Associate Editor, IEEE Trans. on Computational Biology and Bioinformatics
- Madhu Chetty: Associate Editor, Elsevier's Neurocomputing journal
- Yanqing Zhang: Co-Chair: the Special Session on Special Session on Information Technology in Biology and Health at the 2009 International Conference on Bioinformatics & Computational Biology (BIOCOMP'09), Las Vegas, July 13-16, 2009.
- Yanqing Zhang: Program Co-Chair: 2009 International Symposium on Bioinformatics Research and Applications (ISBRA2009), Ft. Lauderdale, May 13-16, 2009.
- Nikhil Pal: Invited one-day seminar on Computational Intelligence in Biomedical Engineering , Chiang Mai University, Chiang Mai, May 23, 2008.

g. Keynotes talks from TC20 members:

- Saman Halgamuge: "Discovering the almost unknown in Biological Data" at International Conference on Bioscience and Biotechnology (BSBT) 2008 held in Hainan, China.
- N. R. Pal: Invited talk at the 7-th International Conference of Bioinformatics (InCoB), 2008 , October 2008, Taiwan
- Limsoon Wong: Constructing More Reliable Protein-Protein Interaction Maps. Invited keynote at Bioinformatica Indica '08: International Symposium on Computational Biology & Bioinformatics, University of Kerala, 17-19 January 2008.
- Limsoon Wong: Guilt by Association. Invited keynote at 1st Japan-Taiwan Young Researchers Conference on Computational and Systems Biology, Hsinchu, Taiwan, 9-11 March 2008.
- Limsoon Wong: Manifestation and Exploitation of Invariants in Bioinformatics. Invited keynote at 3rd International Computer Science Symposium in Russia (CSR 2008), Moscow, Russia, 7-12 June 2008.
- Limsoon Wong: Guilt by Association as a Search Principle. Invited keynote at 31st Annual International ACM SIGIR Conference, Singapore, 20-24 July 2008.
- Limsoon Wong. "Guilt by Association" as a Search Principle. Invited keynote at BioSearch08: HCSNet Next-Generation Search Workshop on Search in Biomedical Information, Queensland University of Technology, Brisbane, Australia, 30 November 2008.
- Limsoon Wong: Identifying Protein Complexes from Protein Interactome Maps. Invited keynote at IEEE International

Workshop on Data Mining and Artificial Intelligence (DMAI 2008) , Khulna, Bangladesh, 25-27 December 2008.

- Limsoon Wong: Identifying Protein Complexes from Protein Interactome Maps. Invited talk at ASI Symposium on Bioinformatics and Data Mining, Hong Kong Baptist University, 26-27 February 2009.
- Limsoon Wong: Identifying Protein Complexes from Protein Interactome Maps. Invited talk at International Conference on Open Source for Computer Aided Drug Discovery (OSCADD 2009), IMTECH, Chandigarh, India, 22-26 March 2009.
- Limsoon Wong: Topology of PPI Networks: Applications and Questions. Talk at Barbados Workshop on Biological and Computational Analysis of Protein-Protein Interaction Networks, Bellairs Research Institute, Barbados, 19-25 April 2009.

h. Selected Publications of TC20 members

- see Appendix B

i. Future Plans:

The main objectives in short term are:

- Successful PRIB 2009, University of Sheffield, UK
- Will decide on PRIB 2010 at the committee meeting during PRIB 2009
- Invite TC-20 members for July 2009 – July 2010 period
- Open Associate Memberships of TC-20 via the website.
- Discuss during PRIB 2009 about expanding TC-20 activities in the following areas:
 - a. Education: through the website, the educational materials such as lecture notes, Tutorials, etc., will be made available.
 - b. Research: a database of bioinformatics applications, bioinformatics software and Benchmark datasets will be maintained.
 - c. Events: look into organizing special sessions, special issues of journals, and competitions, etc.

j. Achievements of TC20 members:

- Nikhil R. Pal is Elected as a Fellow of the IFSA (International Fuzzy Systems Association)
- Saman Halgamuge: Promoted to full Professor from July 2008. Appointed as Assistant Dean (International) in the Faculty of Engineering from November 2008
- Jagath Rajapakse: Promoted as full professor

Appendix -A

PRIB 2009 – Interim Report

Visakan Kadiramanathan & Guido Sanguinetti (Conference Chairs)

Date and Venue

PRIB 2009 is being held in City Hall, Sheffield, United Kingdom during 7 – 9 September 2009.

Plenary Speakers

Four plenary speakers have agreed to give presentations. Their details as follows:

- Pierre Baldi (University of California, Irvine)
- Alvis Brazma (European Bioinformatics Institute, Cambridge)
- Gunnar Rätsch (Max Plank Institute, Tübingen)
- Michael Unser (Ecole Polytechnique Fédérale de Lausanne)

Paper Submissions / Accepts

Full paper submissions were solicited with a deadline of 1 April which was first extended to 15 April and then subsequently to 24 April. In total, 75 full papers were submitted. 38 papers were accepted for inclusion in the Springer LNBI Conference Proceedings with potentially oral and/or poster presentations. Further 19 papers were accepted for inclusion in the Supplementary Proceedings and to be presented as posters. The other 18 papers were rejected. The quality of the submissions was quite high and it was a difficult task to lower the numbers of papers for inclusion of LNBI as it currently stands. Submissions of final camera-ready papers are in progress with a deadline date of 1 July 2009 after which the final paper numbers for inclusion in the proceedings and the programme will be known.

At present, there is a call for short paper submissions with a deadline of 30 June. The papers will be reviewed and if accepted will be included in the supplementary proceedings and also will be presented as posters. A further call for abstracts will be similarly made beginning on 1 July with a deadline of 15 July. All short paper and abstract accept decisions will be made by 20 July and the technical programme finalised soon thereafter.

Special Sessions

A special session on “machine learning for integrative genomics” has been organised by Hollmen, Dugas and Biccato. Another special session is being planned but is yet to receive firm proposals.

Tutorials

Currently, four tutorial proposals are pending. These would be confirmed over the coming weeks and the details announced soon thereafter.

Sponsorship

The conference series is continues to be sponsored by IAPR. The University of Sheffield is also a sponsor and support has been received from PASCAL2 an EU funded network.

Appendix –B

Selected publications (in Bioinformatics) of TC20 members

1. Limsoon Wong:
 - Hon Nian Chua, Kang Ning, Wing-Kin Sung, Hon Wai Leong, Limsoon Wong. Using Indirect Protein-Protein Interactions for Protein Complex Prediction. *Journal of Bioinformatics and Computational Biology*, 6(3):435--466, June 2008.
 - Hon Nian Chua, Limsoon Wong. Increasing the Reliability of Protein Interactomes. *Drug Discovery Today*, 13(15/16):652--658, August 2008.
 - Wen-Son Hsieh, Ross Soo, Bee-Keow Peh, Thomas Loh, Difeng Dong, Donny Soh, Limsoon Wong, Simon Green, Judy Chiao, Chun-Ying Cui, Yoke-Fong Lai, Soo-Chin Lee, Benjamin Mow, Richie Soong, Manuel Salto-Tellez, Boon-Cher Goh. Pharmacodynamic Effects of Seliciclib, an Orally Administered Cell Cycle Modulator, in Undifferentiated Nasopharyngeal Cancer. *Clinical Cancer Research*, 15(4):1435--1442, February 2009.
 - Hon Nian Chua, Willy Hugo, Guimei Liu, Xiaoli Li, Limsoon Wong, See-Kiong Ng. A Probabilistic Graph-Theoretic Approach to Integrate Multiple Predictions for the Protein-Protein Subnetwork Prediction Challenge. *Annals of New York Academy of Sciences*, 1158:224-233, March 2009.
2. Raj Acharya
 - Koshore S. Malyavantham, Sambit Bhattacharya, William D. Alonso, Raj Acharya, Ronald Berezney: Spatio-temporal dynamics of replication and transcription sites in the mammalian cell nucleus, *Chromosoma* (2008) 117:553-567.
 - Jyotsna Kasturi, Raj Acharya: A new information-theoretic dissimilarity for clustering time-dependent gene expression profiles modeled with radial basis functions. *IJCNN 2008*: 2857-2864.
 - Sambit Bhattacharya, Raj Acharya, Artem Pliss, Kishore S. Malyavantham, Ronald Berezney: A Hybrid Registration Approach for Matching Genomic Structures in Multimodal Microscopic Images of Living Cells. *IPCV 2008*: 217-221.
3. Saman Halgamuge:
 - K. M. Baten, S. K. Halgamuge and B. C. H. Chang, "Fast splice site detection using information content and feature reduction", *BMC Bioinformatics* 2008, 9(Suppl 12):S8. ISI-JCR impact factor 3.493
 - C.K. Chan, A.L. Hsu, S.K. Halgamuge and S.L. Tang, "Binning Sequences Using Very Sparse Labels within A Metagenome", *BMC Bioinformatics*, 2008, 9:215, 28 April 2008. ISI-JCR impact factor 3.493
 - J. Li, S.K. Halgamuge and S.L. Tang, "Genome classification by gene distribution: an overlapping subspace clustering approach", *BMC Evolutionary Biology*, 2008, 8:116, 23 April 2008. ISI-JCR impact factor 3.92

- K. Chan, A. L. Hsu, S. Tang and S. K. Halgamuge, “Using Growing Self-Organising Maps to Improve the Binning Process in Environmental Whole-Genome Shotgun Sequencing”, *Journal of Biomedicine and Biotechnology*, Volume 2008, Article ID 513701, 10 pages, Jan 2008, Hindawi. ISI-JCR impact factor 1.922
4. Nikhil Pal:
- P. Ghanty and N. R. Pal, Prediction of Protein Folds : Extraction of New Features, Dimensionality Reduction, and Fusion of Heterogeneous Classifiers, *IEEE Transactions on NanoBioscience*, 2009, D.O.I 10.1109/TNB.2009.2016488
 - Yu-Shuen Tsai, Chin-Teng Lin, I-Fang Chung, Nikhil R. Pal and George C. Tseng, Discovery of Dominant and Dormant Genes from Expression Data Using a Novel Generalization of SNR for Multi-class Problems, *BMC Bioinformatics*, 2008, 9:425doi:10.1186/1471-2105-9-425
 - Li-Wei Ko, C. T. Lin, N. R. Pal, C-Y Chuang, T-P Jung, C-F Chao and S-F Liang, EEG-based Subject- and Session-independent Drowsiness Detection: An Unsupervised Approach, *EURASIP Journal on Advances in Signal Processing*, Vol. 2008 (2008), Article ID 519480, doi:10.1155/2008/519480
 - K. Lin, C. T. Lin, N. R. Pal, and S. Ojha, Finding useful building blocks for construction of protein 3-D structures using a structural variant of mountain clustering method, *IEEE Engineering and Medicine in Biology Magazine*, 2009, to appear.
 - N. R. Pal, A. Sharma and S. Sanadhyaa, Deriving meaningful rules from gene expression data for classification, *Journal of Intelligent & Fuzzy Systems*, Vol. 19, No. 3, pp 171-180, 2008
 - Yu-Shuen Tsai, I-Fang Chung, Chin-Teng Lin, and Nikhil R. Pal, Identification of Different Sets of Biomarkers for Diagnostic Classification of Cancers, *Neural Information Processing/ICONIP 2007*, Eds. M. Ishikawa, K. Doya, H. Miyamoto and T. Yamakawa, Vol. 4985/2008, pp 866-875, 2008.
5. Madhu Chetty:
- Hoque M. D., Chetty M., Sattar A. 2008, “Genetic Algorithm in Ab Initio Protein Structure Prediction using Low Resolution Model: A Review”, *Biomedical data and applications*, Eds: Sidhu, A.S., Dillon, T.S. and Chang, E., Springer-Verlag, series in *Studies in Computational Intelligence (SCI) series (in press)*.
 - Hoque M. T., Chetty M., Sattar A., 2009, “Extended HP Model for Protein Structure Prediction.” *Journal of Computational Biology*, Volume 16, <http://www.liebertonline.com/doi/abs/10.1089/cmb.2008.0082?journalCode=cmb>, No. 1, DOI: 10.1089/cmb.2008.0082, pp. 85–103. (Impact factor: 2.109)
 - Hoque M.T. , Chetty M. , Lewis A. and Sattar A., 2009, Twin-Removal in Genetic Algorithms for Protein Structure Prediction using Low Resolution Model, *IEEE/ACM Transactions on Computational Biology and Bioinformatics*, (ISI Impact Factor: 1.803), DOI: 10.1109/TCBB.2009.34,

<http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=4803828&isnumber=4359833> (acceptance date, March 2, 2009)

- Bidargaddi N.P, Chetty M and Kamruzzaman, 2009, Combining Segmental Semi-Markov Models with Neural Networks for Protein Secondary Structure Prediction Neurocomputing, Elsevier's Neucomputing Journal, DOI: 10.1016/j.neucom.2009.04.017, <http://dx.doi.org/10.1016/j.neucom.2009.04.017> (Impact factor 0.86).
- Ooi C.H., Chetty M., Teng S.W., 2009, Predicting the optimal degree of differential prioritization for multiclass molecular classification, IEEE Engineering in medicine and Biology, (Impact factor 1.04) (in press)