School of Computer Engineering

BioInformatics Research Centre (BIRC)

ANNUAL REPORT 2008

Director: Prof Jagath C. Rajapakse

BioInformatics Research Centre
Nanyang Technological University
Research TechnoPlaza
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Contents

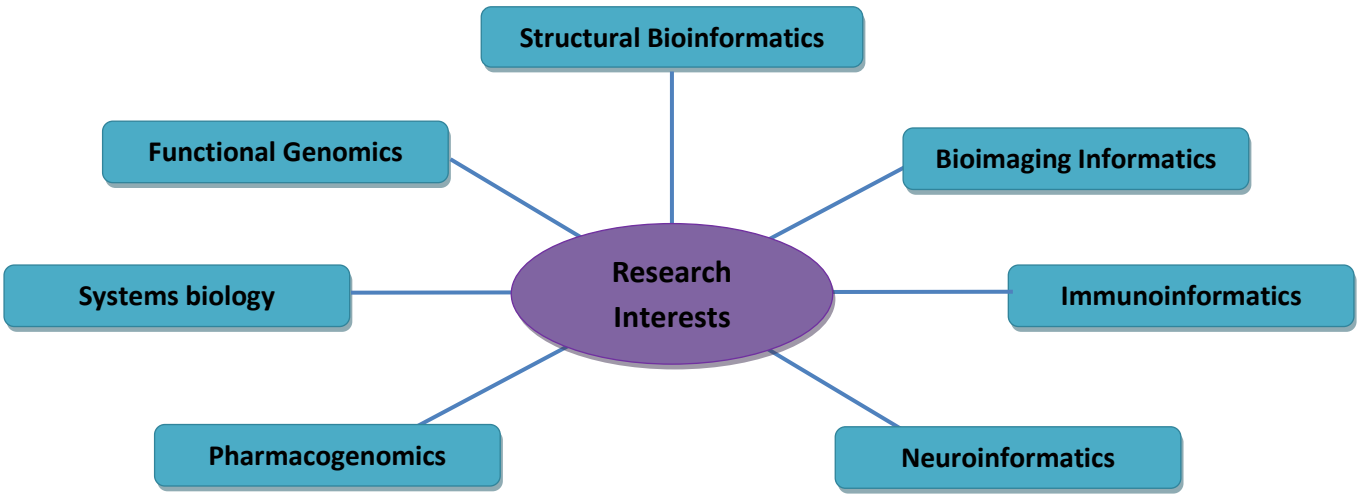
1. INTRODUCTION

1.1. Mission and Vision:

Our Mission is to provide the environment and training to engage in leading and cutting edge research in computational biology and bioinformatics, and thereby become a part of the life sciences forces in Singapore and elsewhere.

Our Vision is to dedicate to the advancement of bioinformatics through education, research, and scientific breakthroughs, leading to discoveries of novel medical drugs and therapies

1.2. Research Interests



2. MEMBERS

2.1 Core faculty

Assoc Prof Sourav Bhowmick	SCE
Assoc Prof Narendra Chaudhari	SCE
Assist Prof Manoranjan Dash	SCE
Assoc Prof Lin Feng	SCE
Asst Prof V. Gopalakrishnan	SCE
Asst Prof Hu Yulan	SCE
Assoc Prof Kwoh Chee Keong	SCE
Assist Prof Jagdish Patra	SCE
Prof Jagath C. Rajapakse	SCE

2.2 Affiliated faculty

Assoc Prof Lay Kee Ang, Ricky	EEE
Adj Assoc Prof Kolatkar Prasanna Ratnakar	GIS/SCE
Adj Assoc Prof Vladimir Kuznetsov	BII/SCE
Adj Assoc Prof Li Xiaoli	I2R/SCE
Adj Assoc Prof Liu Jianjun	GIS/SCE
Assist Prof Mu Yuguan	SBS
Adj Assoc Prof Ng See Kiong	I2R/SCE
Assist Prof Su Haibin	MAE
Adj Prof Roy Welsch	MIT/SCE

2.3 Researchers

Name	Title	Project title	Supervisor	School	Duration
Dr. Nguyen Ngoc Minh	Research Fellow	Protein Structures and Interactions Prediction	Jagath C. Rajapakse	SCE	2006/01/01 – 2008/06/27
Dr. Ma Jianmin	Research Fellow	Gene classification using codon usage bias	Jagath C. Rajapakse	SCE	2004/08/15 – 2008/02/18
Dr. Ho Sy Loi	Research Fellow	Recognition of Translation Initiation Sites (TIS) and Alternate TIS (ATIS) in eukaryotes	Jagath C. Rajapakse	SCE	2006/01/01 – 2008/04/21

Dr. Zhou Juan	Research Fellow	Fusion of functional and structural MR images	Jagath C. Rajapakse	SCE	2008/06/01 – 2008/09/03
Dr. Zheng Xuebin	Research Fellow	Modeling language system with functional MR imaging	Jagath C. Rajapakse	SCE	2007/08/01 – 2008/08/31
Dr. Cheng Jierong	Research Fellow (SMA)	Data Mining & Microscopic Image Analysis	Jagath C. Rajapakse	SCE/ SMA	2007/07/15 –
Mr. Zeng Tao	Research Associate		Li Jinyan	SCE	2008/07/14 – 2009/12/01
Mr. Wu Lin	Project Officer	First principle and multi-scale modeling of high current stable electron emission from carbon nanotube	Ricky Ang	EEE	

2.4 Graduate Students

Name	Title	Project title	Supervisor	School	Duration
Zheng Bo	Ph.D.	Human brain diffusion weighted image processing	Jagath C Rajapakse	SCE	2005 -
Angela Jean	Ph.D. (Part-time)	Phylogeny Analysis for the Determination of Interacting Partners	Lin Feng	SCE	2008/08 –
Iti Chaturvedi	Ph.D.	Predicting gene regulatory networks from time course gene expression	Jagath C Rajapakse	SCE	2006/09 –
Kavuri Swathi	Ph.D.	Evolutionary Approaches to ICA-R and application to Brain Signal Processing	Jagath C Rajapakse	SCE	2006 –
Cheong Lee Sing	Ph.D. (Part-time)	Structural Analysis of Genomic Sequences Using Digital Signal Processing Technology	Lin Feng	SCE	2006/01 –
Alvin Ng	Ph.D.	Analysis of drug treated morphological responses from HCS imaging	Jagath C Rajapakse	SCE/ SMA	2006/08 –
Merlin Veronika	Ph.D.	Developing cell profiling method to identify sub-populations/cell phases from high content images	Jagath C Rajapakse	SCE/ SMA	2006/08 –
Li Yongjin	Ph.D.	Identification of disease genes by	Jagdish Patra	SCE	2007/08

		combining heterogeneous data sources			–
Mundra Piyushkumar	Ph.D.	Feature Selection for Classification of Gene Expression Data	Jagath C Rajapakse	SCE	2007/01 –
Xu Shuoyu	Ph.D.	Image analysis for high throughput cytological profiling from tissue microscopic images in fibrosis	Jagath C Rajapakse	SCE/ SMA	2007/09 –
Zhu Shiwen	Ph.D.	Analyzing Cytoskeletal Protein Colocalization from High-Content	Jagath C Rajapakse	SCE/ SMA	2007/09 –
Fransiskus Xaverius Ivan	Ph.D.	Molecular basis of lung damage-repair under influenza virus infection	Jagath C Rajapakse	SCE/ SMA	2008/08 –
Piao Haiyan	Ph.D.	Microarray Data Analysis for Cancer Diagnosis	Jagdish Patra	SCE	2008/01 –
Liu Qian	Ph.D.	Computational Analysis on Protein Binding and Interactions - A Water Exclusion Perspective	Li Jinyan	SCE	2007/12 –
Zhao Liang	Ph.D.	B-Cell epitope prediction	Li Jinyan	SCE	2008/08 –
Liu Song	Ph.D.	Automated cellular and tissue image processing for subcellular protein localization	Jagath C Rajapakse	SCE	2006 –
Arun Kumar	Ph.D. (Part-time)	Time-frequency analysis of functional MR images	Jagath C Rajapakse	SCE	2005/02 –
Lakhsmi Venkatraman	Ph.D.	Mathematical Model of Transforming-growth factor Beta -1 activation and role of dynamics in progression of liver fibrosis	Sourav Bhowmick	SCE/ SMA	2006 –
Adrianto Wirawan	Ph.D.	Whole Genome Discovery of Transcriptional Regulatory	Kwoh Chee Keong and Bertil Schmidt	SCE	2006/06 - 2009
William Chandra	Ph.D.	First Principle Simulation on GOX BD	Ang Lay Kee, Ricky	EEE	2005/04
Wu Lin	Ph.D. (Part-time)	Modeling of electron emission - its physics and novel applications	Ang Lay Kee, Ricky	EEE	2005-2008
Xiao Shi	Ph.D.	Attack, protection and decentralized search in complex systems	Xiao Gaoxi	EEE	
Zhu Xi	Ph.D.	First Principle Study of New Materials	Su Haibin	MSE	2006
Wang Jinghao	Ph.D.		Su Haibin	MSE	2008/09
Matus Dubecky	Ph.D.	Atomic Scale Study if Mechanisms in Organic PV	Su Haibin	MSE	2008/08
Zhou Feng	Ph.D.	Density Functional Theory Study on Electronic and magnetism Properties of Nanowires	Su Haibin	MSE	2008/08
Yang Jing	Ph.D.	Oxidation of Methanol: Application to	Su Haibin	MSE	2008/08

		Direct Methanol Fuel Cells			
Yang Feng	Ph.D.	Pattern Classification of Very High Dimensional Data	Mao Kezhi	EEE	2008/06
Li Xiang	PhD.	Reliability study of advanced CMOS gate dielectrics using TEM/EELS	Pey Kin Leong	EEE	2005/07
Koh Wee Sing	Ph.D.		Ang Lay Kee	EEE	2005/08
Maria Stepanova	Ph.D.		Lin Feng	SCE	2004/08
Zhou Deyy	Ph.D.		He Yulan	SCE	2005/07
Pang Chee Hwa	Ph.D.		Ang Lay Kee	EEE	2006/07

2.5 Ph.D. awarded

Name	Thesis Title	Supervisor	School	Graduation date
Lu Baifang		Cai Yiyu & Li Lin	MAE	
Lu Le		Li Jinming	SBS	
Zhou Juan	Modeling variability of brain structures, activation, and connectivity	Jagath C. Rajapakse	SCE	

2.6 Master's Degrees Awarded

Nil

3. OUTCOMES

3.1 Awards and Honours

3.1.1 Awards and Honours (Faculty)

- *Nominee for the Best Paper Award*, Third IAPR International Conference on Pattern Recognition in Bioinformatics (PRIB 2008), Melbourne, Australia (Jagath C. Rajapakse and Piyush Mundra)

3.1.2 Awards and Honors (Students)

- *Nominee for the Best Paper Award*, Third IAPR International Conference on Pattern Recognition in Bioinformatics (PATTERN RECOGNITION IN BIOINFORMATICS 2008), Melbourne, Australia (Mr. Piyush Mundra)
- *Travel Award*, World Congress on Computational Intelligence (WCCI 2008), Hong Kong, (Miss Kavuri Swathi Sri)
- *Travel Award*, World Congress on Computational Intelligence (WCCI 2008), Hong Kong, (Mr. Liu Song)

3.2 Talks

- *Invited Talk*: SVM-RFE for Gene Selection for Cancer Classification, First Singapore Symposium on Computational Biology (SYMBIO 2008), August 1, Singapore, (Jagath C. Rajapakse)
- *Invited Talk*: Space charge limited current in quantum and ultrafast regimes, The 7th International Vacuum Electron Source Conference, London, UK, 3-6 August,(L. K. Ang)

3.3 Editorial activities

- *Editorial Board*, Advances in Bioinformatics (Jagath Rajapakse)
- *Associate Editor*, Journal of VLSI Signal Processing (Lin Feng)
- *Associate Editor*, IEEE/ACM Transactions on Computational Biology and Bioinformatics (Jagath Rajapakse)
- *Associate Editor*, IEEE Transactions on Medical Imaging (Jagath Rajapakse)
- *Editorial Board*, Neural Information Processing – Letters and Reviews (Jagath Rajapakse)

3.4 Conference activities

- *Program Chair*, Third International Conference on Pattern Recognition in Bioinformatics (PRIB 2008), Melbourne, Australia, (Jagath Rajapakse)
- *Special Sessions Chair*, International Joint Conference on Neural Networks (IJCNN 2008), Hong Kong (Jagath Rajapakse)
- *Steering Committee*, European Workshop on Evolutionary Computations and Machine Learning in Biology (EvoBIO) (Jagath Rajapakse)
- *Steering Committee*, IEEE Symposium on Computational Intelligence in Bioinformatics and Computational Biology (CIBCB) (Jagath Rajapakse)

3.5 Symposiums and Workshops organized

- *Workshop,* BIRC Workshop on Protein Structure and Function Prediction, Oct 25th 2008
- *Workshop,* BIRC Workshop on Advances in Bioinformatics, Feb 2nd 2008

3.6 Grants

Project Title	Funding Agency	Grant Amount (S$)	Partner Organization and Collaborators	NTU PI(s)	Start and end dates
Dynamically adaptable neurocomputer and its Application to recognition of steroid hormone response elements	MOE Tier-1	$92,459		Lin Feng	11/2006 – 2008
Grid-based comparative genomics pipeline for detecting conserved non-coding functional regions	BMRC-A*Star	$143,000	Prof Wei Wang (Department of Computing and Information Technology, Fudan University)	Jagath Rajapakse	10/2005 – 04/2008
Grid-based comparative genomics	MOE Tier-1	$140,000			
Quasi-bipartite Graphs for Modelling Protein Binding Sites and Their Functional Homogeneity Study	MOE Tier-1	$130,000	HUST, SCUT	Li Jinyan	03/2008 – 03/2011
The Protein Binding Hot Spots Are Water Free?	MOE Tier-2	$730,020 (includes 2 RSS awards)	HUST, SCUT	Li Jinyan	12/2008 – 12/2011
Advanced Image Computational Analysis	Singapore-MIT Alliance	$1,639,560 (includes 5 RSS awards)	MIT, SMART Singapore, NUS, SIgN, IMB	Jagath Rajapakse	07/2002 -
Advanced Image Informatics	Singapore-MIT Alliance	$850,000 (includes 2 RSS awards)	MIT, NUS,	Sourav Bhowmick	07/2002 -

GPU-enable genomics	NVIDIA Inc.	$25,000	NVIDIA	Bertil Schmidt	10/2008 – 09/2010

4. PUBLICATIONS

4.1 Books

Nil

4.2 Journal Papers

1 W. Liu, B. Schmidt, G. Voss, W. Müller-Wittig, 2008, "Accelerating molecular dynamics simulations using Graphics Processing Units with CUDA", *Computer Physics Communications* 179 (9), pp. 634-641 (IF = 2.120)

2 T. Oliver, L.Y. Yeow, B. Schmidt, 2008, "Integrating FPGA acceleration into HMMer", *Parallel Computing* 34 (11), pp. 681-691 (IF= 1.309)

3 A. Wirawan, C.K. Kwoh, N.T. Hieu, B. Schmidt, 2008, "CBESW: Sequence alignment on the playstation 3 ",*BMC Bioinformatics* 9, art. no. 377 (IF = 3.781)

4 A. Singh, C. Chen, W. Liu, W. Mitchell, B. Schmidt, 2008, "A hybrid computational grid architecture for comparative genomics", *IEEE Transactions on Information Technology in Biomedicine* 12 (2), pp. 218-225 (IF = 1.939)

5 D.T. Singh, R. Trehan, B. Schmidt, T. Bretschneider, 2008, "Comparative phyloinformatics of virus genes at micro and macro levels in a distributed computing environment", *BMC Bioinformatics* 9 (SUPPL. 1), art. no. S23 (IF = 3.781)

6 J. Zhou, J.C. Rajapakse, 2008, "Fuzzy approach to incorporate hemodynamic variability and contextual information for detection of brain activation, *Neurocomputing* 71 (16-18), pp. 3184-3192 (IF = 1.234)

7 J.C. Rajapakse, Y. Wang, X. Zheng, J. Zhou, 2008, "Probabilistic framework for brain connectivity from functional MR images", *IEEE Transactions on Medical Imaging* 27 (6), pp. 825-833. (IF = 4.004)

8 T.V. Nguyen and J.C. Patra, 2008, "A simple ICA-based digital image watermarking scheme", *Digital Signal Processing (Elsevier Science),* Vol. 18, No. 5, pp. 762-776. (IF = 1.486)

9 T.V. Nguyen, and P. K. Meher, 2008, "WMicaD: A New Digital Watermarking Technique Using Independent Component Analysis", *EURASIP Journal on Advances in Signal Processing, Vol. 2008, No. ,* pp. 1-9 . (IF = 1.055)

10 J. C. Patra, M. Juhola, and P. K. Meher 2008, "Intelligent sensors using computationally efficient Chebyshev neural networks", *IET Science, Measurement & Technology, Vol. 2, pp. 68-75* (IF = 0.663)

11 A. Wirawan, C.K. Kwoh, N.T. Hieu, B. Schmidt, T.H. Nim, 2008, "CBESW: Sequence Alignment on the Playstation", BMC Bioinformatics. vol. 9, p. 377. (IF = 3.781)

12 D. Zhou, Y.L. He, C.K. Kwoh, 2008, "Extracting Protein-Protein Interactions from MEDLINE using the Hidden Vector State model", *International Journal of Bioinformatics Research a nd Applications*, Vol 4 No.1, pp 64-80. (IF =)

13 G. Zhang, A. Khan, K. Srinivasan, A.T. Heiny, K.X. Lee, C.K. Kwoh, J.T. August, and V. Brusic, 2008 "Hotspot Hunter: a computational system for large-scale screening and selection of candidate immunological hotspots in pathogen proteomes," *BMC Bioinformatics*, vol. 9, p. S19. (IF = 3.781)

14 G. Liu, J. Li, L. Wong, 2008, "A New Concise Representation of Frequent Itemsets Using Generators and A Positive Border", *Knowledge and Information Systems: An International Journal, Vol. 17, No. 1, pp. 35-56* (IF = 1.733)

15 L. Wu, and L.K. Ang, 2008, "Nonequilibrium model of ultrafast laser-induced electron photofield emission from a dc-biased metallic surface", *Physical Review B,* vol. 78, p. 224112. (IF = 7.180)

16 H.S. Sim, S.P. Lau, L.K. Ang, M. Tanemura, and K. Yamaguchi, 2008, "Multi-purpose ionization gas sensing devices using carbon nanofibers on plastic substrates", *Diamond and Related Materials*" vol. 17, pp. 1959-1962 (IF = 2.092)

17 L. Wu, and L.K. Ang, 2008, "Low temperature refrigeration by using thermal-field electron emission in a coaxial cylindrical diode*", J. Appl. Phys*. 104, 084506, (IF= 2.201)

18 H.S. Sim, S.P. Lau, L.K. Ang, G. F. You, M. Tanemura, and K. Yamaguchi, M. Zamri, and M. Yusop, 2008, "Field emission from a single carbon nanofiber at sub 100 nm gap", *Appl. Phys. Lett.* 93, 023131, (IF = 2.201)

19 P. Zhang, W.S. Koh, L.K. Ang, and S. H. Chen, , 2008 "Short pulse space-charge-limited electron flows in a drift space", Phys. Plasmas 15, (IF = 2.427)

4.3 Edited Books

Nil

4.4 Books chapters

1 D. Zhou, Y. He, and C. Kwoh, 2008, "From Biomedical Literature to Knowledge: Mining Protein-Protein Interactions," in Computational Intelligence in Biomedicine and Bioinformatics, Vol. 151, pp. 397-421.

4.5 Refereed Conference Papers

1 H. Zhang, A. Wirawan, B. Schmidt, W. Müller-Wittig, 2008, "Accelerating BLASTP on the cell broadband engine", *Third IAPR International Conference on Pattern Recognition in Bioinformatics*, LNBI Vol.5265, pp. 460-470.

2 C. Chen, B. Schmidt, L. Weiguo, W. Müller-Wittig, 2008, "GPU-MEME: Using graphics hardware to accelerate motif finding in DNA sequences", *Third IAPR International Conference on Pattern Recognition in Bioinformatics,* LNBI Vol. 5265, pp. 448-459.

3 A. Wirawan, B. Schmidt, C.K. Kwoh, 2008, "Parallel DNA Sequence Alignment on the Cell Broadband Engine", 7th International Conference on Parallel Processing and Applied Mathematics (PPAM 2007), Gdansk, Poland, Springer, LNCS Vol. 4967, pp. 1249-1256.

4 A. Singh, C. Chen, W. Liu, W. Mitchell, B. Schmidt, 2008, "A hybrid computational grid architecture for comparative genomics", LNCS Vol. 4967, pp. 1249-1256.

5 I. Chaturvedi, J.C. Rajapakse, 2008, "Fusion of gene regulatory and protein interaction networks using skip-chain models", *Third IAPR International Conference on Pattern Recognition in Bioinformatics,* LNBI Vol. 5265, pp. 214-224.

6 P.A. Mundra, J.C. Rajapakse, 2008, "Support vector based T-score for gene ranking", *Third IAPR International Conference on Pattern Recognition in Bioinformatics,* LNBI Vol. 5265, pp. 144-153.

7 G.L. Prajapati, N.S. Chaudhari, M. Chandwani, 2008, "Efficient incremental model for learning context-free grammars from positive structural examples", LNAI Vol. 5138, pp. 250-262.

8 S.A.A. Shalom, M. Dash, M. Tue, 2008, "Efficient K-means clustering using accelerated graphics processors", *10th International Conference on Data Warehousing and Knowledge Discovery (DAWAK),* LNCS Vol. 5182, pp. 166-175.

9 W. Ng, M. Dash, 2008, “Efficient approximate mining of frequent patterns over transactional data streams”, *10th International Conference on Data Warehousing and Knowledge Discovery (DAWAK),* LNCS Vol. 5182, pp. 241-250.

10 W. Ng, M. Dash, 2008, “A test paradigm for detecting changes in transactional data streams”, *13th International Conference on Database Systems for Advanced Applications (DASFAA*), LNCS, Vol. 4947 pp. 204-219.

11 M. Dash, V. Gopalkrishnan, 2008, “Distance based feature selection for clustering microarray data”, *13th International Conference on Database Systems for Advanced Applications (DASFAA*), LNCS Vol. 4947, pp. 204-219.

12 B. Schmidt, S. Aluru, D.A. Bader, 2008, “*7th IEEE International Workshop on High Performance Computational Biology HiCOMB 2008* “,*IPDPS Miami 2008* - Proceedings of the 22nd IEEE International Parallel and Distributed Processing Symposium, Program and CD-ROM,

13 T. H Nim, C.K. Kwoh, A. Wirawan, B. Schmidt, 2008, “Applications of heterogeneous structure of cell broadband engine architecture for biological database similarity search”, *2nd International Conference on Bioinformatics and Biomedical Engineering, iCBBE 2008*, pp. 5-8 .

14 S. Liu, J.C. Rajapakse, 2008, “Protein localization on cellular images with Markov random fields”, *Proceedings of the International Joint Conference on Neural Networks*, pp. 2127-2132.

15 K.S. Sri, J.C. Rajapakse, 2008, “Extracting EEG rhythms using ICA-R”, *Proceedings of the International Joint Conference on Neural Networks*, pp. 2133-2138

16 H.L. Tan, N.S Chaudhari, J. Zhou, 2008, “Time series prediction using principal feature analysis”, 2008 *3rd IEEE Conference on Industrial Electronics and Applications, ICIEA 2008*, pp. 292-297.

17 G.L. Prajapati, N.S. Chaudhari, M. Chandwani, 2008, “On learning context-free grammars using skeletons, *Proceedings - 1st International Conference on Emerging Trends in Engineering and Technology, ICETET 2008*, pp. 1150-1155.

18 J. Li, K. Sim, G. Liu, L. Wong, 2008, “Maximal quasi-bicliques with balanced noise tolerance: Concepts and co-clustering applications”, Society for Industrial and Applied Mathematics - *8th SIAM International Conference on Data Mining 2008,* Proceedings in Applied Mathematics 130 1, pp. 72-83.

19 D. Lo, S.C. Khoo, and J. Li, 2008, Mining and Ranking Generators of Sequential Patterns, *SIAM International Conference on Data Mining (SDM08)*, Atlanta, United States, pp. 553-564

20 M. Wu, X. Li, C.K. Kwoh, S. K. Ng, 2008, “Semantic labeling to identify reliable interactions in the protein interaction network”, *The 2nd International Conference on Bioinformatics and Biomedical Engineering (iCBBE 2008)*, Shanghai, China.

21 W. Lin, L. K. Ang, and W. S. Koh, 2008, " TO3.00006: Nonequilibrium model of ultrafast laser induced electron emission from a dc-biased metallic surface, " *The 50th APS-DPP Annual meeting*, Vol. 53, No. 14, pp 243.

22 W. Lin, L. K. Ang, and W. S. Koh, 2008 " YP6.00055: Low temperature refrigeration by using thermal-field emission in a coaxial cylindrical diode, " *The 50th APS-DPP Annual meeting*, Vol. 53, No. 14, pp 336.

23 W. S. Koh, L. K. Ang , S. H. Chen, L. C. Tai ,and L. Wu, 2008," UP6.00083: 2D limiting current of a finite-width electron pulse in a parallel-plate gap, " *The 50th APS-DPP Annual meeting*, Vol. 53, No. 14, pp 306.

24 L. C. Lai, P. Zhang, W. S. Koh, L.K. Ang , and S. H. Chen, 2008, " PP6.00056: The Effect of the Self-Magnetic Field on the Current Limit in a Laser Wakefield Accelerator (LWFA)," *The 50th APS-DPP Annual meeting*, Vol. 53, No. 14, pp 218.

25 G. J. Zhu, X. Zhou, T.S. Lee, L.K. Ang, G.H. See, and S.H. Lin, 2008, "A compact model for undoped symmetric double-gate MOSFET with Schottky-Barrier Source Drain", *Proc. of the 2008 European Solid-State Device Research Conference*.

4.6 Conference Short Papers, Abstracts, and Posters

5. STATISTICS 2008

Number of core faculty	09
Number of researchers	08
Number of Ph.D. students	33
Number of Ph.D. graduated	03
Number of M.Sc. students	
Total active grants	8
Total Funding	S$3,750,039
Funding per core faculty	S$468,754.87
Number of journal papers	19
Number of conference papers	25
Number of books	Nil
Number of books chapters	01
Total impact factor	46.768
Impact factor per paper	2.46
Impact factor per core faculty	5.20

6. COLLABORATORS

Faculty Name	Partners organization and Collaborator	Description of the Project	Funding
Assoc Prof Lin Feng	GIS		Nil
	BII		Nil
Assoc Prof Li Jinyan	Professor Qiang Yang (Hong Kong University of Science and Technology)	Transfer learning in bioinformatics problems	
	Professor Yuanqing Li (South China University of Technology)	Genomic neuroscience	
Assoc Prof Sourav Saha Bhowmick	C Forbes Dewey, Jr (MIT)		
	Hanry Yu (NUS)		-
	Lisa Kellogg (NUS)		
Prof Jagath C. Rajapakse	Prof Roy Welsch (Sloan School, MIT), Prof Peter So (Department of Biological Engineering, MIT), Prof Paul Matsudaira (Department of Biological Sciences, NUS)	Mining cells from high content images for tissue systems biology	Singapore-MIT Alliance

	A/Prof Vincent Chow (Department of Microbiology, NUS), Prof Jianzhu Chen (Department of Biology, MIT)	Molecular basis of lung damage-repair under influenza virus infection	Singapore-MIT Alliance, SMART (ID IRG), Singapore
	Prof Hanry Yu (Department of Physiology, NUS), Prof Peter So	Image informatics for liver fibrosis	Singapore-MIT Alliance
	Dr. Simon See (Sun Microsystems, Inc.)	High performance computing for advanced image analysis	Sun Microsystems, USA
	Prof Wei Wang (Department of Computing and Information Technology, Fudan University)	Grid-enabled pipeline for detecting functionally important conserved non-coding regions from	BMRC-A*STAR, MOE
	Dr. Alexei Kochetov (Institute of Cytology and Genetics, Russian Academy of Sciences), Prof Akinori Sarai (Department of Biochemical Engineering, Kyushu Institute of Technology, Japan), A/Prof Shandar Ahmad (Jamia Millia Islamia University, New Delhi), Prof Jacek Zurada (Electrical and Computer Engineering Department, University of Louisville), Dr. Gray Fogel (Natural Selection Inc., USA)	Prediction of gene and protein features	BIRC-NTU

7. PATENTS