

Annual Report of the Instrumentation Physics Laboratory 2012

The Instrumentation Physics Laboratory currently has three main areas of research:

Video and Image Processing – the group headed by Dr. Maricor Soriano develops instrumentation and algorithms to analyse signals, images and video from multidisciplinary domains such as marine science, arts and heritage, medicine, and sports.

Complex System – the group headed by Dr. May Lim analyses and models sociotechnical systems which are rich in empirical data. The group headed by Dr. Johnrob Bantang investigates biological systems and granular materials from a complex system perspective. Research done by Dr. Giovanni Tapang looks into patterns and synchronization in historical records and literature.

Optics and Photonics – Dr Tapang together with Dr. Caesar Saloma leads research in optics, microscopy and microfabrication.

In February 2012, the physical space occupied by the IPL expanded when Dr. Soriano was granted rooms R203 and R204 for her subgroup.

Composition

From June 2012, the Instrumentation Physics Lab has six (6) Ph.D.'s among its senior staff. These are

1. Dr. Caesar Saloma
2. Dr. Maricor Soriano (Coordinator)
3. Dr. May Lim
4. Dr. Giovanni Tapang
5. Dr. Johnrob Bantang
6. Dr. Jesus Felix Valenzuela

This year the student members of the Instrumentation Physics Lab total forty-seven (47) , seventeen (17) of which are graduate students and thirty (30) are undergraduates.

PHD (10)

1. Stephen Daedalus E. Separa, MS
2. Maria Teresa Pulido , MS
3. Christian M. Alis, MS
4. Josephine Jill T. Cabatbat, MS
5. Paul Leonard Atchong C. Hilario, MS
6. Reniel B. Cabral, MS
7. Benjamin E. Palmares, MS
8. Gerold C. Pedemonte, MS
9. Antonino Paguirigan
10. Rosemarie Terio

MS (7)

1. Aivin Solatorio
2. Nicole Valdez

3. Mar Philip Elaurza
4. Jen-Jen Manuel
5. John Paolo Maulion
6. James Christopher Pang
7. Louela Alva Presbitero
8. Michael Castanares

5TH YEAR (10)

1. Haneka Celine Lava
2. Maelori Krista Nambatac
3. Mary Angelie Alagao
4. Gino Borja
5. Aimee Rarugal
6. Kristine Faith Roque
7. Mabelle Salvador
8. Gabriel Dominik Sison
9. Gilian Uy
10. Maria Eloisa Ventura

4TH YEAR (12)

1. Meryl Regine Algodon
2. Adrian Chester Balingit
3. Katherine Anne Bulan
4. Aerial Constantino
5. Phoebe Gallanosa
6. Wynn Dunn Gil Improso
7. Abigail Mae Jayin
8. Chris Eric Limos
9. Norman Mascarinas
10. Lugienor Lucille Roberto
11. Alix Jean Santos
12. Anjali Tarun

3rd YEAR (8)

1. Damian Dailisan
2. Ma. Christina Jamerlan
3. Pio Gabrielle Calderon
4. Alfred Abella
5. Julia Rio Therese Negre
6. Ritz Ann Aguilar
7. Krister Jazz Urog
8. Pamela Anne Pasion

From January to May 2012 the following members have gone to various postings but remain active in IPL research as adjunct researchers:

1. Dr. Rene Batac – Postdoc in Max Planck Institute for the Physics of Complex Systems, Germany
2. Dr. Anthony Longjas – Postdoc National Center for Earth-surface Dynamics (NCED), University of Minnesota

3. Dr. Christopher Monterola – Senior Scientist and Principal Investigator in the Complex Systems Programme, Computing Science Department, Institute of High Performance Computing, A*STAR, Singapore
4. Dr. Erika Fille Legara – Scientist at Complex Systems Programme, Computing Science Department, Institute of High Performance Computing A*STAR Singapore
5. Dr. Marianne Ranzivelle Roxas-Villanueva – Physics Faculty in UP Los Banos
6. Dr. Marissa Pastor – Postdoc in Asia Pacific Center for Theoretical Physics , South Korea

Publication

International Publications (ISI) (7)

1. J. C. Pang, J. Bantang, C. Monterola, Effect of random link malfunctions to synchronization of Hodgkin-Huxley neurons in a lattice network, *Int. J. Mod. Phys. C* 23(3), 1250027 (2012). [DOI: 10.1142/S0129183112500271]
2. R. Batac, A. Longjas, C. Monterola, Statistical distributions of avalanche size and waiting times in an inter-sandpile cascade model, *Physica A* 391, 616-624 (2012). [DOI: 10.1016/j.physa.2011.08.032]
3. C. M. Alis and M. T. Lim. Adaptation of fictional and online conversations to communication media, *Eur. Phys. J. B* 85:397 (2012). DOI: 10.1140/epjb/e2012-30711-0
4. J. S. L. Combinido and M. T. Lim, Crowding effects in vehicular traffic, *PLoS ONE* 7(11): e48151 (2012) DOI: 10.1371/journal.pone.0048151
5. R.B. Cabral, A. Cruz-Trinidad, R.C. Geronimo, P.M. Aliño. 2012. Opportunities and Challenges in the Coral Triangle. *Environmental Science and Technology* 46: 7930-7931.
6. RANZIVELLE MARIANNE ROXAS-VILLANUEVA, MAELORI KRISTA NAMBATAC, and GIOVANNI TAPANG, *Int. J. Mod. Phys. C* 23, 1250009 (2012)
7. Rene Batac, Anthony Longjas, Christopher Monterola, Statistical distributions of avalanche size and waiting times in an inter-sandpile cascade model, *Physica A: Statistical Mechanics and its Applications*, Volume 391, Issue 3, 1 February 2012, Pages 616-624

International Conference Proceedings (4)

1. R.N. Muallil, R.B. Cabral, S.S. Mamauag, P.M. Aliño. 2012. Status, trend and sustainability of small-scale fisheries in the Philippines: insights from Fish Information for Sustainable Harvests Bio-Economic (FISH-BE) Model. *Proceedings of the 12th International Coral Reef Symposium (ICRS)*, July 2012, Cairns, Australia.
2. Judilla, Roel John; Jauod, Jaylord; Capilli, Eusebio Jr.; Soriano, Maricor; , "Teardrop - a rapid reef mosaicking tool for coastal communities," *ICRS, 2012 - Cairns*, July 2012.
3. Corpuz, Francis James; Naval, Prospero; Capili, Eusebio; Jauod, Jaylord; Judilla, Roel John; Soriano, Maricor; , "Coral reef mosaicking using Teardrop and Fast Image Labeling," *OCEANS, 2012 - Yeosu* , vol., no., pp.1-6, 21-24 May 2012
4. Corpuz, Francis James; Naval, Prospero ; Capili, Eusebio ; Jauod, Jaylord ; Judilla, Roel John ; Soriano, Maricor, Rapid shallow coastal coral reef mapping using the teardrop system, *OCEANS, 2012 West Virginia*, 4-19 Oct. 2012.

Papers in the Samahang Pisika ng Pilipinas Physics Congress, De La Salle Health Sciences Institute 24-26 October 2012 (28)

1. Algodon, Meryl & M. Soriano,, Area Calibration of an Underwater Camera for Coral Cover Estimation
2. Balingit, Adrian Chester, R.B. Cabral, M.T. Lim. , Growth patterns for competition in a single species forest
3. Bulan, Katherine Anne & J. Bantang, Contact infection epidemics in a random geometric network using cellular automata model
4. Constantino, Luvieline Aerial, Mode synchronization and dynamics in VCSELs with feedback
5. Improso, Wynn Dunn Gil, Zero order diffraction suppression in phase - only hologram reconstruction
6. Jamerlan, Ma. Christina, Synset subnetworks in translations
7. Jayin, Abigail Mae, , Anjali Tarun, Rene Batac, Erika Fille Legara and Johnrob Bantang Popularity of personalities in society as driven by news
8. Limos, Chris Eric, & M. Soriano, Application of Shadow Rugosity via Block Segmentation
9. Mascarinas, Norman, Effect of temporal and spatial resolution on the apparent diffusion coefficient and mean free path of a Brownian particle
10. Nambatac, Maelori Krista, Fractal dimension and object eccentricity trends in natural and synthetic images
11. Pasion, Pamela Anne, Comprehensibility, Readability and Sub-network Deletion in Semantic Networks
12. Rarugal, Aimee, Highly Influential Factors on Oil Prices in the Philippines
13. Roque, Kristine Faith, Radiation forces exerted on a microsphere by a broadband Gaussian beam
14. Saludares, Maria Isabel, P. Gallanosa, A. Santos, & M. Soriano Trajectory tracking in a wide field using two fixed cameras and neural network.
15. Sison, Gabriel Dominik, Weight Distribution and Modularity of the Co-authorship Network of the 8th-14th Philippine Congresses
16. Tarun, Anjali, Abigail Mae Jayin, Rene Batac, Anthony Longjas and Johnrob Bantang. Asymmetrical Collapse and two dimensional spreading of a binary granular column
17. Uy, Gilian, R. Cabral, M. Lim. Random Walker with a Turning Angle Preference
18. Ventura, Ma. Eloisa, Phase encoding Limitation of Spatial Light modulator
19. Cabral, Reniel, Effect of fish aggregating devices (FADs) on catch and stock biomass: A mean-field model
20. Elaurza, Mar Philip , Determination of diffusion coefficient via wavelet correlation
21. Solatorio, Aivin, M. Lim, Complexity in Human Online Communication: Analysis and Modeling of User's Sending Patterns in E-mail and Twitter
22. Valdez, Nicole, Decadal and Genre Comparison of Musical Networks from MIDI Files
23. James Christopher Pang, Christopher Monterola and Johnrob Bantang. Structural Correlation of Networks Formed by Branching Dendrites and Multilevel Marketing Recruitment Process
24. Rene Batac and Holger Kantz. Incorporating spatial properties in the statistical analysis of Philippine earthquakes

25. Jen-Jen Manuel and Jesus Felix Valenzuela. Stimulus-driven consensus of allelomimetic agents in a confined environment
26. C. M. Alis and M. T. Lim. Data mining social networks: self-selection in a Twitter contest
27. R.B. Cabral, P.M. Aliño, M.T. Lim. Effect of fish aggregating devices (FADs) on catch and stock biomass: A mean-field model.
28. G. C. Pedemonte and M. T. Lim. Small-world effect in a uniform-radius broadcasting network

Projects Initiated or On-going

1. ARRAS – Automated Rapid Reef Assessment System (June 2010 – May 2013) : Project Leader Maricor Soriano. Funded by DOST
2. Information Patterns in Network-Mediated Interactions. (Project No. 111102 PNSE) OVCRD Outright Research Grant. March 2011 - February 2012. : Project Leader May Lim
3. VISSER Versatile Instrumentation System for Science Education and Research DOST-GIA : Giovanni Tapang and Romel Gomez

International Meetings/Workshops

1. M. T. Lim. [1] Workshop on Science Applications of GNSS in Developing Countries. 11-27 April 2012. [2] AIP Industrial Physics Forum 2012: Capacity Building for Industrial Physics in Developing and Emerging Economies. 16-20 April 2012. [3] From Genes to Atomic Structures: an Introduction to Synchrotron-Based Structural Biology 23-27 April 2012. International Centre for Theoretical Physics, Trieste, Italy.
2. R. B. Cabral. Regional State of the Coral Triangle Workshop. ADB Headquarters, Manila, Philippines. 26-27 April 2012
3. V. Solatorio. Fourth Hands-On Research in Complex Systems School, Shanghai, China, 17-29 June 2012
4. R. B. Cabral. 12th International Coral Reef Symposium, Cairns, Australia, 7-13 July 2012
5. M. Soriano. 12th International Coral Reef Symposium, Cairns, Australia, 7-13 July 2012
6. C. M. Alis. School on Large Scale Problems in Machine Learning and Workshop on Common Concepts in Machine Learning and Statistical Physics, ICTP, Trieste, Italy, 20-31 August 2012
7. R. B. Cabral. Monitoring and Evaluation Working Group and Regional State of the Coral Triangle Workshop. Hotel Borubudur, Jakarta, Indonesia. 22-23 October 2012

Extension and Linkages

MOU with Advanced Imaging Technology Laboratory, Kyoto University resulting in establishment of joint laboratory on digital imaging of heritage objects. Feb 2012