

# Ranadip Pal

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## EDUCATION:

**Texas A&M University**, College Station, TX  
**PhD**, Electrical & Computer Engineering, 2007

**Texas A&M University**, College Station, TX  
**M.S.**, Electrical Engineering, 2004

**Indian Institute of Technology (IIT)**, Kharagpur, India  
**B. Tech.** Electronics and Electrical Communication Engineering, 2002

## EXPERIENCE:

Fall 2013 –  
**Associate Professor**,  
Electrical and Computer Engineering Department, Texas Tech University, Lubbock TX


Fall 2007 – Summer 2013  
**Assistant Professor**,  
Electrical and Computer Engineering Department, Texas Tech University, Lubbock TX

Fall 2002 – Summer 2007  
**Research Assistant, Genomic Signal Processing Lab**,  
Electrical and Computer Engineering Department, Texas A &M University, College Station TX

## HONORS

- 2014: *Whitacre Research Award*
- 2012: *President's Excellence in Teaching Award*
- 2010: *NSF CAREER Award*
- 2010: COE Hemphill-Wells New Professor Excellence in Teaching Award Nominee
- 2010: Golden Key International Honour Society Honorary Membership
- 2010: National Society of Collegiate Scholars (NSCS) Distinguished Membership
- 2005: Ebsenberger/Fouraker Fellowship Award for Research (in addition to RA stipend)
- 2005: Association of Former students Distinguished Graduate Student Masters Research Award
- 2004: National Instruments Research Fellowship
- 1998: Ranked in top 0.3 percent in IIT Joint Entrance Exam among 120,000 applicants.
- 1998: Ranked 8<sup>th</sup> in West Bengal State Joint Entrance Exam (among 60,000 applicants).
- 1997: Indian National Math Olympiad Awardee: Ranked 23rd in all over India
- 1996: Ranked 1<sup>st</sup> in Regional Math Olympiad, West Bengal, India

## JOURNAL PUBLICATIONS

- 28 Q. Wan, **R. Pal** “An ensemble based top performing approach for NCI-DREAM drug sensitivity prediction challenge”, accepted in *PLOS ONE*
- 27 N. Berlow, S. Haider, Q. Wan, M. Geltzeiler, L. E. Davis, C. Keller, **R. Pal** “An integrated approach to anti-cancer drugs sensitivity prediction”, accepted in *BMC Genomics*
- 26 M. U. Caglar, **R. Pal** “A Diverse Stochastic Search Algorithm for Combination Therapeutics”, *BioMed Research International*, 2014
25. **R. Pal** “Modeling and inference of genetic interactions”, *WIREs Data Mining Knowl Discov* 2013. doi: 10.1002/widm.1103
- 24 N. Berlow, L. Davis, E. Cantor, B. Seguin, C. Keller, **R. Pal**, “A new approach for prediction of tumor sensitivity to targeted drugs based on functional data”, *BMC Bioinformatics*, 2013, 14:239  

- 23 M. U. Caglar, **R. Pal**, “Stochastic Model Simulation Using Kronecker Product Analysis and Zassenhaus Formula Approximation”, *IEEE/ACM Transactions on Computational Biology and Bioinformatics*, Vol 10, Issue 5, pages 1125-1136, 2013. [10.1109/TCBB.2013.34](https://doi.org/10.1109/TCBB.2013.34)
- 22 S. Haider, **R. Pal**, “Integrated Analysis of Transcriptomic and Proteomic Data”, *Current Genomics*, Vol 14, Issue 2, pages 91-110, 2013
- 21 S. Haider, **R. Pal**, “Boolean network inference from time series data incorporating prior biological knowledge”, *BMC Genomics* 2012, **13**(Suppl 6):S9, [doi:10.1186/1471-2164-13-S6-S9](https://doi.org/10.1186/1471-2164-13-S6-S9)
- 20 N. Berlow, **R. Pal**, “Generation of Stationary control policies with best expected performance for a family of Markov Chains”, *Journal of Biological Systems*, Vol. 20, No. 4, pages 423-440, 2012.
- 19 J. Abraham, Y. X. Chua, J. M. Glover, J. W. Tyner, M. M. Loriaux, A. Kilcoyne, F. J. Giles, L. D. Nelson, J. S. Carew, Y. Ouyang, J. E. Michalek, **R. Pal**, B. J. Druker, B. P. Rubin, C. Keller, “An adaptive Src–PDGFRA–Raf axis in rhabdomyosarcoma”, *Biochemical and Biophysical Research Communications*, Vol 426 (3), Pages 363-368, 2012.
- 18 **R. Pal**, S. Bhattacharya “Transient dynamics of reduced order models of genetic regulatory networks” *IEEE/ACM Transactions on Computational Biology and Bioinformatics*, Volume 9 Issue 4, ,Pages 1230-1244 PMID 22411891, 2012.
- 17 **R. Pal**, S. Bhattacharya, M. U. Caglar, “Robust Approaches for Genetic Regulatory Network Modeling and Intervention”, *IEEE Signal Processing Magazine*, Vol. 29, No. 1, Pg. 66-76, 2012
- 16 B. P. Rubin, K. Nishijo, H. H. Chen, X. Yi, D. P. Schuetze, **R. Pal**, S. I. Prajapati, J. Abraham, B. R. Arenkiel, QR Chen, S. Davis, A. T. McCleish, M. R. Capecchi, J. E. Michalek, L. A. Zarzabal, J. Khan, Z. Yu, D. M. Parham, F. G. Barr, P. S. Meltzer, Y. Chen, C. Keller “Evidence for an Unanticipated Relationship Between Undifferentiated Pleomorphic Sarcoma and Embryonal Rhabdomyosarcoma” *Cancer Cell*, Vol. 19, Pg. 177-191, No. 2, 2011.
- 15 **R. Pal**, S. Bhattacharya “Characterizing the effect of coarse-scale PBN modeling on dynamics and intervention performance of genetic regulatory networks represented by Stochastic Master Equation”, *IEEE Transactions on Signal Processing*, Vol. 58, Pg. 3341 - 3351, No.6, 2010
- 14 **R. Pal** “Context-Sensitive Probabilistic Boolean Networks: Steady State Properties, Reduction and Steady State Approximation”, *IEEE Transactions on Signal Processing*, Vol. 58, Pg. 879-890, No.2, 2010
- 13 E. R. Dougherty, **R. Pal**, X. Qian, A. Datta “Stationary and Structural Control in Gene Regulatory Networks: Basic Concepts”, *International Journal of Systems Science*, Vol. 41, No. 1, 5-16, 2010
- 12 **R. Pal**, A. Datta and E. Dougherty "Bayesian Robustness in the Control of Gene Regulatory Networks", *IEEE Transactions on Signal Processing*, Vol 57, Pg. 3667-3678, 2009

- 11 R. Layek, A. Datta, **R. Pal**, E. R. Dougherty, “Adaptive Intervention in Probabilistic Boolean Networks”, *Bioinformatics*, Vol 25, Pg. 2042-2048, 2009
- 10 **R. Pal**, A. Datta and E. Dougherty "Robust Intervention in Probabilistic Boolean Networks", *IEEE Transactions on Signal Processing*, Vol 56, No. 3, Pg. 1280-94, 2008.
- 9 Y. Qian, J. Venkatraj, R. Barhoumi, **R. Pal**, A. Datta, J. R. Wild and E. Tiffany-Castiglioni "Comparative Non-cholinergic Neurotoxic Effects of Paraoxon and Diisopropyl Fluorophosphate (DFP) on Human Neuroblastoma and Astrocytoma Cell Lines", *Toxicology and Applied Pharmacology*, Vol. 219, No.2-3, Pg. 162-171, 2007.
- 8 A. Datta, **R. Pal**, A. Choudhary and E. Dougherty "Control Approaches for Probabilistic Gene Regulatory Networks", *IEEE Signal Processing Magazine*, Vol. 24, No. 1, 54-63, 2007.
- 7 Ivanov, **R. Pal** and E. Dougherty, "Size Reducing Mappings between Probabilistic Boolean Networks", *IEEE Transactions on Signal Processing*, Vol. 55, no 5, 2310-2322, 2007.
- 6 **R. Pal**, A. Datta and E. Dougherty, “Optimal Infinite Horizon Control for Probabilistic Boolean Networks”, *IEEE Transactions on Signal Processing*, Vol. 54, no. 6 : 2375-2387, 2006.
- 5 A. Datta, **R. Pal** and E. Dougherty, “Intervention in Probabilistic Gene Regulatory Networks”, *Current Bioinformatics*, Vol. 1, No. 2: 167-184, 2006.
- 4 **R. Pal**, I. Ivanov, A. Datta and E. Dougherty. “Generating Boolean Networks with a Prescribed Attractor Structure” *Bioinformatics*, 2005, 21: 4021-4025.
- 3 **R. Pal**, A. Datta, A. J. Fornace, M. L. Bittner and E. Dougherty. “Boolean Relationships among Genes Responsive to Ionizing Radiation in the NCI 60 ACDS” *Bioinformatics*, 2005, 21: 1542–1549.
- 2 **R. Pal**, A. Datta, M. L. Bittner and E. Dougherty. “Intervention in Context Sensitive Probabilistic Boolean Networks”, *Bioinformatics*, 2005, 21: 1211-1218
- 1 X. Zhou , X. Wang, **R. Pal** , I. Ivanov, M. Bittner and E. Dougherty , “ A Bayesian Connectivity-based Approach to Constructing Probabilistic Gene Regulatory Networks”, *Bioinformatics*, 2004 20: 2918-2927

## **EDITORIAL/FOREWORD**

- **R. Pal**, Y. Huang, Y. Chen, “Selected articles from the IEEE International Workshop on Genomic Signal Processing and Statistics (GENSIPS'2011)”, *BMC Genomics* 2012, **13**(Suppl 6):S1, doi:10.1186/1471-2164-13-S6-S1
- E. R. Dougherty, B-J Yoon, X Qian, **R Pal**, “Special Issue on Genomic Signal Processing: Foreword”, *Journal of Biological Systems*, Vol 20, No 4, vii-viii, 2012

## **CONFERENCE PUBLICATIONS**

### **Peer Reviewed Conference Proceedings**

- 33 Q. Wan and **R. Pal**. “A multivariate random forest based framework for drug sensitivity prediction”.*IEEE International Workshop on Genomic Signal Processing and Statistics(GENSIPS), 2013,doi [10.1109/GENSIPS.2013.6735929](https://doi.org/10.1109/GENSIPS.2013.6735929)*
- 32 N. Berlow, S. Haider, **R. Pal**, and C. Keller. “Quantifying the inference power of a drug screen for predictive analysis” *IEEE International Workshop on Genomic Signal Processing and Statistics(GENSIPS)*, pgs: 49-52, 2013. doi [10.1109/GENSIPS.2013.6735928](https://doi.org/10.1109/GENSIPS.2013.6735928)
- 31 S. Haider and **R. Pal** “Inference of tumor inhibition pathways from drug perturbation data” accepted *IEEE Global Conference on Signal and Image Processing (GlobalSIP)*, pgs: 95-98, 2013 doi [10.1109/GlobalSIP.2013.6736823](https://doi.org/10.1109/GlobalSIP.2013.6736823)

- 30 S. Haider, N. Berlow, **R. Pal**, L. Davis and C. Keller “Combination Therapy Design for Targeted Therapeutics from a Drug-Protein Interaction Perspective” *IEEE International Workshop on Genomic Signal Processing and Statistics*, GENSIPS, pages 58-61, 2012 [10.1109/GENSIPS.2012.6507726](https://doi.org/10.1109/GENSIPS.2012.6507726)
- 29 **R. Pal** and N. Berlow and S. Haider “Anticancer Drug Sensitivity Analysis: An integrated approach applied to Erlotinib sensitivity prediction in the CCLE Database” *IEEE International Workshop on Genomic Signal Processing and Statistics*, GENSIPS, pages 9-12, 2012 [10.1109/GENSIPS.2012.6507714](https://doi.org/10.1109/GENSIPS.2012.6507714)
- 28 M. U. Caglar, **R. Pal**, “Complexity reduction of Stochastic Master Equation Simulation based on Kronecker Product Analysis”, *BCB’12 Proceedings of the ACM Conference on Bioinformatics, Computational Biology and Biomedicine*, pages 186-193, 2012, doi [10.1145/2382936.2382960](https://doi.org/10.1145/2382936.2382960)
- 27 N. Berlow, **R. Pal**, L. Davis, C. Keller, “Analyzing Pathway Design From Drug Perturbation Experiments”, *IEEE Statistical Signal Processing (SSP) workshop, 2012*, pages 552-55, doi [10.1109/SSP.2012.6319757](https://doi.org/10.1109/SSP.2012.6319757)
- 26 **R. Pal**, N. Berlow, “A Kinase inhibition map approach for tumor sensitivity prediction and combination therapy design for targeted drugs”, *Pacific Symposium on Biocomputing (PSB) 2012: 351-62*, PMID 22174290
- 25 N. Berlow, **R. Pal**, “A novel approach for tumor sensitivity prediction and combination therapy design for targeted drugs” *IEEE International Workshop on Genomic Signal Processing and Statistics*, GENSIPS, 2011 doi [10.1109/GENSIPS.2011.6169435](https://doi.org/10.1109/GENSIPS.2011.6169435)
- 24 S. Haider, **R. Pal**, “Inference of a Genetic Regulatory Network model from limited time series data” *IEEE International Workshop on Genomic Signal Processing and Statistics*, GENSIPS, 2011, doi [10.1109/GENSIPS.2011.6169470](https://doi.org/10.1109/GENSIPS.2011.6169470)
- 23 S. Bhattacharya, **R. Pal**, “A novel critical time analysis approach for Genetic Regulatory Networks” *IEEE International Workshop on Genomic Signal Processing and Statistics*, GENSIPS, 2011, doi [10.1109/GENSIPS.2011.6169433](https://doi.org/10.1109/GENSIPS.2011.6169433)
- 22 N. Berlow, **R. Pal**, “Generation Of Intervention Strategy For A Genetic Regulatory Network Represented By A Family Of Markov Chains” *33rd Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), 2011*. PMID 22256100
- 21 **R. Pal**, D. Hoover, “Analyzing the effects of coarse-scale modeling of genetic regulatory networks”, *International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2011*.
- 20 **R. Pal**, M. U. Caglar, “Control of stochastic master equation models of genetic regulatory networks by approximating their average behavior”, *IEEE International Workshop on Genomic Signal Processing and Statistics*, GENSIPS, 2010 doi [10.1109/GENSIPS.2010.5719681](https://doi.org/10.1109/GENSIPS.2010.5719681)
- 19 **R. Pal**, S. Bhattacharya “Effect of coarse-scale modeling on control outcome of genetic regulatory networks” *Proceedings of the American Control Conference (ACC)*, pages 5942-47, 2010.
- 18 K. Akrofi, **R. Pal**, M. Baker, B. Nutter, R. Schiffer “Classification of Alzheimer’s Disease and Mild Cognitive Impairment by Pattern Recognition of EEG Power and Coherence”, *International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2010*. Doi [10.1109/ICASSP.2010.5495193](https://doi.org/10.1109/ICASSP.2010.5495193)
- 17 Y. Yang, **R. Pal**, M. O’Boyle “Classification of cognitive states using functional MRI data”, *SPIE symposium on Medical Imaging*, 2010, doi:[10.1117/12.845261](https://doi.org/10.1117/12.845261)
- 16 **R. Pal**, S. Bhattacharya “Steady-State Preserving Reduction for Genetic Regulatory Network Models”, *IEEE International Symposium of Computer-Based Medical Systems (IEEE CBMS 2009)*, doi [10.1109/CBMS.2009.5255246](https://doi.org/10.1109/CBMS.2009.5255246)
- 15 **R. Pal** “Analyzing Steady State Probability Distributions of Context-Sensitive Probabilistic Boolean Networks”, *IEEE International Workshop on Genomic Signal Processing and Statistics*, GENSIPS, 2009, doi [10.1109/GENSIPS.2009.5174325](https://doi.org/10.1109/GENSIPS.2009.5174325)
- 14 **R. Pal**, A. Datta, E. R. Dougherty “Quantification of data extraction noise in Probabilistic Boolean Network Modeling”, *IEEE International Workshop on Genomic Signal Processing and Statistics*, GENSIPS, 2009, doi [10.1109/GENSIPS.2009.5174324](https://doi.org/10.1109/GENSIPS.2009.5174324)
- 13 R. Layek, A. Datta, **R. Pal**, E. Dougherty “Adaptive Intervention in Probabilistic Boolean Networks”, *Proceedings of the American Control Conference*, Pg. 5647-5652, 2009
- 12 **R. Pal**, A. Datta and E. Dougherty, “Comparison of Robust Strategies for the control of gene regulatory networks”, *IEEE International Workshop on Genomic Signal Processing and Statistics*, GENSIPS, Phoenix, June 8-10, 2008.

- 11 **R. Pal**, H. Lahdesmaki, I. Shmulevich, O. Yli-Harja and E. Dougherty, “On the constraint of gene regulatory networks to canalizing functions and post classes”, *IEEE International Workshop on Genomic Signal Processing and Statistics*, GENSIPS, Phoenix, June 8-10, 2008.
- 10 **R. Pal**, A. Datta and E. Dougherty “Bayesian Robustness in the control of Gene Regulatory Networks”, *Proceedings of the IEEE Statistical Signal Processing Workshop*, 31-35, Madison, Wisconsin, August 2007.
- 9 **R. Pal**, A. Datta and E. Dougherty “Robustness of Intervention strategies for Probabilistic Boolean Networks”, *IEEE International Workshop on Genomic Signal Processing and Statistics*, GENSIPS, Tuusula, Finland, June 2007.
- 8 **R. Pal**, A. Datta and E. Dougherty “Robust Intervention in Probabilistic Boolean Networks”, *Proceedings of the American Control Conference*, 2405-2410, New York, NY, July 2007.
- 7 I. Ivanov, **R. Pal**, and E. Dougherty , “Applying Reduction Mappings in Designing Genomic Regulatory Networks”, *IEEE/NLM International Workshop on Life Science Systems and Applications*, 2006
- 6 **R. Pal**, I. Ivanov, A. Datta, M. L. Bittner and E. Dougherty “Synthesizing Boolean Networks with a Given Attractor Structure”, *IEEE International Workshop on Genomic Signal Processing and Statistics*, GENSIPS, College Station, Texas, May 2006
- 5 **R. Pal**, A. Datta and E. Dougherty, “Optimal Infinite Horizon Control for Probabilistic Boolean Networks”, *Proceedings of the American Control Conference*, 668-673, Minneapolis, MN, June 2006.
- 4 **R. Pal**, A. Datta and E. Dougherty, “Altering Steady-State Probabilities in Probabilistic Boolean Networks”, *IEEE International Workshop on Genomic Signal Processing and Statistics*, GENSIPS, College Station, Texas, May 2006.
- 3 I. Ivanov, **R. Pal** and E. Dougherty, “Dynamics-Preserving Size Reduction Mappings for Probabilistic Boolean Networks”, *IEEE International Workshop on Genomic Signal Processing and Statistics*, GENSIPS, College Station, Texas, May 2006.
- 2 **R. Pal**, A. Datta, Michael Bittner, E. Dougherty “External Control in a Special Class of Probabilistic Boolean Networks”, *Proceedings of the American Control Conference*, 411-416, Portland, OR, June 2005 .
- 1 **R. Pal**, A. Datta, M. L. Bittner and E. Dougherty, “External Control in Probabilistic Boolean Networks”, *IEEE International Workshop on Genomic Signal Processing and Statistics*, GENSIPS, Newport, RI, May 2005.

### **Invited Conference Proceedings and other Abstracts**

1. M. N. Geltzeiler, P. E. Andersen, N. D. Gross, E. L. Cantor, N. Berlow, **Pal, R.**, and Keller, C. Personalized cancer care for head and neck squamous cell carcinoma. *Otolaryngology - Head and Neck Surgery*, 149(2 suppl):P184, 2013
2. K. Schroeder, E. Huang, N. Berlow, **R. Pal**, O. Becher “High throughput in-vitro drug screen to identify novel therapeutic targets for Diffuse Intrinsic Pontine Glioma”, 15th *International Symposium on Pediatric Neuro-Oncology – ISPNO*, Toronto, June 2012
3. M. U. Caglar, **R. Pal** “Simulation of stochastic models with Kronecker product analysis & Zassenhaus approximation” *Biophysical Society 56th annual Meeting*, San Diego, California; February 25-29, 2012
4. M. U. Caglar, **R. Pal**, “Relationships between genetic regulatory network models’, *IEEE Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, California, Nov, 2011
5. **R. Pal**, N. Berlow, “A new approach for tumor sensitivity prediction and combination therapy design for targeted drugs”, *Innovations in Cancer Prevention and Research Conference*, Austin, Texas, Nov 2011
6. U. Caglar, **R. Pal**, “Comparison of Control Approaches in Genetic Regulatory Networks by Using Stochastic Master Equation Models, Probabilistic Boolean Network Models and Differential Equation Models and Estimated Error Analyzes”, *American Physical Society, APS March Meeting* 2011, March 21-25, 2011, abstract #X40.014

7. U. Caglar, **R. Pal** "Control of Stochastic Master Equation Models of Genetic Regulatory Networks by Approximating Their Average Behavior" *Joint Fall 2010 Meeting of the Texas Sections of the APS, AAPT, Zone 13 of SPS and the NSHP* <http://meetings.aps.org/link/BAPS.2010.TSF.FM3.5>
8. S. Mitra, M. O'Boyle, F. Afrin, B. Nutter, M. Baker, **R. Pal** , B. Ghosh, "Generating Structure function Correlation by ICA- based Mapping of Activation Patterns on Co-registered fMRI and FADTI", *IEEE Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, California, October 26-29, 2008.
9. A. Datta, **R. Pal** and E. Dougherty, "Control Approaches for Probabilistic Gene Regulatory Networks," *Proceedings of the 14<sup>th</sup> Yale Workshop on Adaptive and Learning Systems*, pages 7-13, June 2-4, 2008
10. **R. Pal**, A. Datta and E. Dougherty "Robust Intervention in Probabilistic Boolean Networks", *Proceedings of the Asilomar Conference on Signals, Systems and Computers*, November 2007.

## **RESEARCH CITATIONS**

<i>(first publication in 2004)</i>	<i>Google Scholar</i>
h-index	<b>12</b>
Total Citations	<b>796</b>

(Feb 2014)

## **GRADUATE STUDENT SUPERVISION**

### Current Students

#### **Ph.D.**

- Mehmet Umut Caglar
- Saad Haider
- Noah Berlow

#### **M.S.**

- Qian Wan

### Graduated Students

- Nima Jaafari, MS, Summer, 2012
- Sonal Bhattacharya, PhD, Fall 2011
- Ye Yang, M.S., Summer 2010
- Scott Block, M.S., Fall 2010
- Dongri Meng, M.S., Spring 2011

## **DISSERTATION COMMITTEE MEMBER**

- Arun Kumar Gururajan, Graduated in Spring 2009
- Bryan Hughes, Graduated in Spring 2010
- Muneem Shahriar, Graduated in Summer 2012
- Enrique Corona, Graduated in Summer 2012
- Sridharan Kamalakannan, Graduated in Fall 2012
- I-Wen Feng, Graduated in Summer 2013
- Jingqi Ao, Expected Fall 2013
- Bian Li, Expected Fall 2013
- Mesfin Dema, Expected Fall 2013

## UNDERGRADUATE ADVISING

- Davis Hoover : Summer - Fall 2010
- Nima Jaafari: Summer - Fall 2010
- Kim Ico: Summer 2010
- Stephen Vickers, Brian Gerlach and Jacob Smalts: *Biological System Monitoring*, Fall 2008
- Edward Alvarado: *FMRI data analysis*, Summer 2008
- Forrest Jones: *Genomic Data Analysis*, Spring 2009
- Robert Zirpoli: *Inference of Functional Relationships*, Spring 2010

## TEACHING

### **Summary:**

**Fall 2007- Present:** Has developed three graduate/senior-undergraduate level courses (ECE 5355, ECE5350, ECE 5332/EE 4332) and regularly taught an electrical engineering undergraduate course (ECE 3353), graduate/senior-undergraduate course (EE 5367/ECE4367), and graduate (ECE 5371) level course.

### **Details:**

#### **ECE 5355: Genomic Signal processing and Control:** *Fall 2007, Fall 2010, Fall 2012*

- Developed this interdisciplinary graduate course that provides an introduction to molecular biology and the engineering concepts of genomic data processing, classification, genetic regulatory network modeling and control.
- Students from Electrical Engineering, Mathematics, Physics and Biotechnology disciplines have enrolled in this course.
- This course started as a special topics subject and was converted into a regular course based on its effectiveness and encouraging response from students and is now an elective for the new bioengineering MS program.

#### **ECE 5332/ ECE 4332: Random Signals and Systems:** *Spring 2008, Fall 2011*

- Developed this course to strengthen the stochastic background of senior undergraduates and graduate students.
- ECE department is in the process of converting this special topics course into a regular course.

#### **ECE 5367/ECE 4367: Image Processing:** *Fall 2008, Fall 200, Fall 2013*

- In addition to the Image Processing fundamentals, also presented the cutting edge and fun technologies in this area like High Dynamic Range Imaging, Photo Tourism etc. to keep up the motivation of the students.

#### **ECE 5350: Introduction to Medical Instrumentation:** *Spring 2009*

- Developed the first ever offering of the Medical Instrumentation course in the TTU ECE department. The course is one of the six core courses for the new MS in Bio-Engineering program.

#### **ECE 5371: Engineering Analysis:** *Spring 2014*

#### **ECE 3353: Feedback Control Systems,** *Fall 2009, Spring 2010, Spring 2011, Spring 2012, Spring 2013*

- Considered by ECE undergraduate students to be one of the toughest courses. The following comment in the course evaluation by a student supports this statement and also suggests that students enjoyed the instructor's course offering: "*This course was difficult, at least more so than others. However, I found it to be just right to stimulate learning. I greatly enjoyed this course with Dr. Pal. It has been one of my favorite*".

## **BROADER ENGINEERING EDUCATION**

- *Organized Contest on Design in Engineering CODE 2009* <http://cvial.ece.ttu.edu/code2009/> for high school and community college students. High school students from as far as Presidio which is a small town on the USA Mexico border with a population of 4000 attended the contest. The teams were assigned TTU ECE undergraduate mentors and they communicated with them on technical issues related to their design project. Led the discussions during contest kickoff where the students were introduced to opportunities at Texas Tech by engineering ambassadors and ECE mentors.
- In Summer 2009, supervised three high schools students (*Leigh Logsdon, Katherine Bilbro and Austin Reid*) in a month long **internship** to build prototype engineering devices for healthcare.
- Presented seminars to primarily medical community at Texas Tech University Health Sciences Center (Cancer Grand Rounds, Oct 2009) and University of Texas Health Sciences Center at San Antonio (May 2008).

## **SERVICE**

### **Service to the ECE Department**

- Graduate Studies Committee Member: Fall 2007 – Present
- Computer Engineering Curriculum Committee Chair: Spring 2013 – Present
- Electrical Engineering Faculty Search Committee Member: Fall 2008 – Spring 2009
- Computer Engineering Faculty Search Committee Member: Fall 2009 – Present
- Energy Faculty Search Committee Member: Fall 2012-Present
- ABET Communications and Signal Processing Subcommittee Member: Fall 2009 – Present

### **Service to University**

- Chemical Engineering Faculty Search Committee: Fall 2008
- TTU Career Forum Panelist: 2010, 2011
- TTU TLDC “*What the Best Teachers Do*” Panelist, 2012
- Bioengineering Committee: Fall 2013- Spring 2014

### **Service to Profession**

- **Associate Editor** : *EURASIP journal on Bioinformatics and Computational Biology* 2013-
- **NSF Review Panelist**, 2014
- **NIH Mail in Reviewer**, 2014
- **Technical Program Co-Chair**, IEEE GENSIPS 2013
- **NSF Review Panelist**, 2012
- **Organizing Committee Co-chair** IEEE GENSIPS 2012
- *EURASIP journal on Bioinformatics and Computational Biology*: **Guest Editor** for special issue on *computational methods for biomarker discovery and systems biology research*
- **BMC Genomics Lead Supplement Editor**, 2012,  
<http://www.biomedcentral.com/bmcgenomics/supplements/13/S6>
- **Program Committee Member**, International Workshop on Data Mining in Bioinformatics BIODDD’12
- *Journal of Biological Systems*, **Guest Editor** for special issue on *Genomic Signal Processing*
- **Program Committee Member** IEEE CBMS, 2012
- **Program Committee Member** International Conference on Intelligent Biology and Medicine (ICIBM), 2012 , 2013



- *NIH R03 mail-in Reviewer*, 2012
- **Publications Chair**, IEEE GENSIPS 2011
- **Session Chair** for Clustering and Classification Methods, *IEEE GENSIPS 2011*
- *ICASSP 2011*, **organizer of special session** on *Advanced Signal Processing in Systems Biology*
- **NSF Review Panelist**, 2010
- *NSF ad-hoc Reviewer*, 2010
- *Program Committee Member*, IEEE International Workshop on Genomic Signal Processing and Statistics (GENSIPS), 2010
- *International Program Committee Member*, BIOCOMP'10 – International Conference on Bioinformatics and Computational Biology, 2010
- *Program Committee Member*, IEEE International Symposium on Computer-Based Medical Systems (CBMS), 2009
- **NSF CAREER Review Panelist**, 2008
- **Finance Chair**, IEEE International Workshop on Genomic Signal Processing and Statistics (GENSIPS), 2008
- **Oral Session Chair** for Image Analysis, Networks & Control, IEEE GENSIPS 2008
- REVIEWER
  - IEEE Transactions on Signal Processing
  - IEEE Transactions on Systems, Man and Cybernetics
  - IEEE/ACM Transactions on Computational Biology and Bioinformatics
  - IEEE Transactions on Neural Networks
  - IEEE Transactions on Biomedical Engineering
  - Bioinformatics
  - Journal of Theoretical Biology
  - Automatica
  - IET Systems Biology
  - EURASIP Journal on Bioinformatics and Systems Biology

### **Professional Memberships**

- Institute of Electrical and Electronics Engineers (IEEE) Member
- American Association for the Advancement of Science (AAAS) Member

### **SELECTED INVITED TALKS**

- “*Modeling of cancer pathway*”, Knight Cancer Institute Seminar Series, Oregon Health & Science University, October, 2011
- “*Robust Modeling and Control of Genetic Regulatory Networks*”, Schlumberger Cambridge Research Center, September 2011
- “*Tackling Model Complexity of Genetic Regulatory Networks*” USF Computer Science and Engineering Department 30<sup>th</sup> Anniversary Lecture Series, March 2011
- “*Analyzing the effects of coarse-scale modeling of genetic regulatory networks*”, Department of Physics, Texas Tech University, September 2010
- “*Tackling the issue of noise and limited data in Systems Biology & Biomedicine*” Electrical and Computer Engineering Department, Texas A&M University, May 2010
- “*Modeling and Control in Cancer Genomics*”, Cancer Grand Rounds, Texas Tech University Health Sciences Center, September 2009
- “*Crossroads of Biology and Engineering*”, Systems Biology Day, University of Texas Health Sciences Center at San Antonio, May 2008
- “*Boolean Relationships among Genes Responsive to Ionizing Radiation in the NCI 60 ACDS*”, Bioinformatics Seminar, Statistics Department, Texas A&M University, February 2005