

Spring 2012

## The Department of Electrical and Computer Engineering Newsletter

University of Dayton. Department of Electrical and Computer Engineering

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## Calendar of Events

### Explore Engineering

February 25, 2012

### ECE's Advisory Council

#### Meeting

March 23, 2012

### Graduate Commencement

May 5, 2012

### Undergraduate

#### Commencement

May 6, 2012

### UD Reunion Weekend '12

June 8-12, 2012

### Summer Honors

#### Engineering Camp

June 17-22, 2012

### Women In Engineering

#### Summer Camp

July 8-13, 2012

### Summer Graduation

August 8, 2012

(No Ceremony)

### Fall Classes Begin

August 22, 2012

UNIVERSITY of



DAYTON

## Chair's Corner

Dr. Guru Subramanyam

What an exciting year for us, as we continue our Centennial Celebration! Our celebration included a School of Engineering Gala during the Engineers' week. During the Gala, one of our own alumni, Mr. John McHale was inducted into the School of Engineering's inaugural Hall of Fame. Mr. McHale is a serial entrepreneur in the field of Computer Networking, an area of enormous importance in this digital age. It was nice to see Mr. McHale and his family in attendance for the Gala and the SoE Hall of Fame induction ceremony. He has been an outstanding supporter of UD. We also had other reasons to celebrate! Professor Partha Banerjee was inducted as a Fellow of the Institute of Physics, Great Britain. Professor Banerjee is also going to be recognized in April as one of the outstanding engineers and scientists in the Dayton area, by the Affiliate Societies Council of Dayton. Our department has a special recognition function on March

23, 2012, for Professor Banerjee's awards. As I mentioned in my previous letter, this year is a key year for us as we plan to review our graduate curriculum and revitalize our graduate courses. Our department's Industrial Advisory Committee (IAC) loved our curricular changes. This year, we are also focusing on our undergraduate curricular issues including the new Common Academic Program (CAP) which will be replacing the general education at UD starting from Fall 2013. We are using this as an opportunity to make curricular changes in our programs. The IAC is also providing guidance to our department's strategic planning for the next decade. We are identifying key areas that we will need to strengthen to be among the best ECE programs in the Midwest. We are grateful for the excellent support and guidance of our IAC members. With their guidance and support, I have no doubt we will be among the best in the Midwest. It was wonderful to see several of our alumni

during the Centennial Gala and throughout this special year. I was mentioning to one of our alumni that if he comes next time I will buy his lunch! I do want to make one request regarding your donations. Please do remember to assign your donations to Electrical and Computer Engineering. Otherwise, it goes into a general UD fund, and our department will not benefit from it. We are still working on a special fund for supporting women in ECE, for additional scholarships to cover their text books through-out their undergraduate education in our department. We welcome your support regarding this new initiative.



## Dr. Partha Banerjee Elected Fellow of Institute of Physics



Dr. Partha Banerjee, Professor of Electro-Optics and Electrical and Computer

Engineering, was recently elected to Fellowship of the Institute of Physics "in recognition of (his) personal contribution to the advancement of physics as a discipline and a profession". The Institute of Physics is a leading international scientific society that originated in England in 1920 to advance physics re-

search, application and education. It merged with the Physical Society (of London) in 1960. Sir Peter Knight, who was President of the Optical Society of America in 2003, is the current president. Fellowships (FInstPs) are granted to those who make "an outstanding contribution to the profession". Some notable FInstPs include Sir John Pendry (Professor, Imperial College) who revolutionized the concept of metamaterials, Akhlesh Lakhtakia (Professor, Penn State) who works on

chiral materials, and Dr. Stephen Chu (energy secretary, USA and Nobel laureate) who has worked on cooling of electrons with laser light.

Dr. Banerjee is the only faculty at UD to be bestowed with this honor. Dr. Banerjee's research interests include metamaterials, digital holography, nonlinear optics, and acousto-optics. He is also Fellow of OSA and SPIE, and has authored 5 textbooks and over 100 refereed journal publications.

## News from the Vision Lab



*"The Vision Lab's Robust Artificial Intelligence-based Defense Electro-Robot (RAIDER) is leading the way with autonomous navigation and interior surveillance."*

Taking surveillance research to the next level, the University of Dayton Vision Lab is making automatic security robots. The new Vision Lab robot, named the Robust Artificial Intelligence-based Defense Electro-Robot (RAIDER), combines many of the Vision Lab's biometric algorithmic to create a machine that "remembers". Using the face recognition technology, the RAIDER will be able to roam the Kettering Labs hallways recognizing people it has previously seen and becoming familiar with faces of new students. In addition to

face recognition, the RAIDER will also be equipped with action recognition technology to distinguish ordinary hallway actions (walking, standing, talking, etc.) from alarming actions (punching, kicking, running, etc.). Will this robot be controlled by someone? No. As the RAIDER travels down the corridors off-line algorithms will use 3D reconstruction computer vision algorithms to autonomously navigate through the hallways. "The RAIDER is a self-thinking, self-deciding security patrol robot. It recognizes people it has already met, recog-

nizes everyday actions and decides where it wants to go next," describes Yakov Diskin, a PhD Student at the Vision Lab. To learn more about the RAIDER and other exciting research going on at the Vision Lab, visit [www.visionlab.udayton.edu](http://www.visionlab.udayton.edu).



*Ph.D. student Yakov Diskin*

## Mr. John McHale (ELE, '78) Inducted into the Inaugural SoE Hall of Fame



Building and then selling a high-technology startup company to a leading computer manufacturer in 1995 could have been written off as a lucky break. Doing it again 3 years later lent credibility to electrical engineer and entrepreneur John McHale. Then he did it a third time. Today,

McHale is chairman of Breaking Point, which builds and tests equipment to help networking companies build faster and bigger networks. He is also the chairman and CEO of Tracking Point, a defense technology company developing precision-guided firearms. In 2008, the UD National Alumni Association named McHale Distinguished Alumnus for his achievements in the fields of busi-

ness, innovation, and technology advancement. McHale has supported the Minority Engineering Program, provided for the development of a curriculum that emphasizes qualities and skills of leadership, communication, and team building that prepare our graduates to bring immediate value to the workplace. McHale credits his success to UD. "I have done with

my business what my professors taught me at UD— always look for the opportunities. I've taken mine, and given back to be sure other students have the same opportunity." When asked if UD is a special place McHale replied, "you bet it is. I really see the hand of God in all of this." Mr. McHale was also instrumental in setting up the Bernard M. Schmidt Chair in Engineering Leadership.

## In Memoriam

Submitted by Zhenghang Gu

In early morning of November 6th, 2011, a tragic car accident took two University of Dayton students' young lives away, Hanqing Wu and Zhongyi Xu. Hanqing and Zhongyi are both from China and first year engineering students. On the way back to campus, their car crashed into a tree on the side of Mad River Road. Hanqing

Wu was a first year Electrical Engineering major from Suzhou, China. The faculty and students were all shocked. The school announced the tragedy to the parents of both students immediately, and provided support to the students' families. UD had memorial services for all faculty and student members to say goodbye to

these two young students. More than 500 of our faculty and students attended the memorial event and expressed their support to the families of the students. Many of our students went to the sad place where the accident happened to create a memorial for their friends. Following the tragedy the

international students' office communicated and helped students to cope with the tragedy and support each other. The student body is closer and stronger after this tragedy. Family members are grateful for the help from the school. The two students will not be forgotten by our UD friends.

## Rocket Man

by Robert Barnes

Robert Barnes, a junior Electrical Engineering major, has been fascinated with flight since he was seven years old. After watching *Superman*, he thought that given a cape he too could fly. He then proceeded to make his own cape and jumped off the tool shed converting potential energy into kinetic energy. This taught him one of the most meaningful lessons in his life, to *do* things instead of just reading about them. According to Barnes, "theory is great, but someone has to take the pencil away from the paper and build something." He also enjoys fast things, and building rockets allowed him to use the knowledge that he had acquired and

also build something that would travel at high velocity. The first rocket ever built by Barnes was a basic cardboard tube rocket kit with an Estes D12 motor, simple yet it still had good acceleration. This did not satisfy his need for speed and he then built his first 'real' rocket. This rocket was all fiberglass, 4 ft. tall and required the permission of FAA to fly it. He then built an 8ft. tall orange rocket thinking it would be his last. However, after certifying Level 1 and Level 2 with the National Association of Rocketry, he started thinking about even *bigger* rockets. The yellow rocket featured in the picture is 12 ft. tall and will fly

approximately two miles high. It will have a maximum thrust of 3,500 lbs, a max velocity of Mach 1, and will take about one year to complete. Barnes love for rockets has been passed on to his eight year old daughter, who enjoyed her first small rocket and now her high quality fiberglass rocket. The rocket featured at the right, was painted in her two favorite colors, red and pink. She is looking forward to the first flight of her new rocket. Barnes is "very thankful to be attending the University of Dayton. I like the scientific research and I like the fact that the staff and students want to help others and *do* something".



*Rob with his young daughter, Caitie, and their rockets ready to take flight! To see onboard video of two of his rockets, visit: <http://www.youtube.com/watch?v=LYZyg3WF4xc>*

## Patrice Lalor Excels on the Court and in the Classroom



The life of a college athlete is filled with practices, workouts, games, attending classes, doing homework, and volunteering in the community. Patrice Lalor, senior Electrical and Computer Engineering major, is a key component to the Flyers women's basketball team's success over the past four years. She currently has an impressive 3.67 GPA and is a two time Arthur Ashe Jr.

Scholar Athlete. Lalor is presently the co-captain of the lady Flyers, and was named Pre-season Atlantic 10 Third Team All Conference this year. She has been leading in career assists every year with 464, enough for third place and only 32 assists away from second place. Her career assist to turnover ratio is 1.61, and the best in UD's record books. Off the court, Lalor serves as a mentor to high school students, and

frequently volunteers with the women's basketball team.

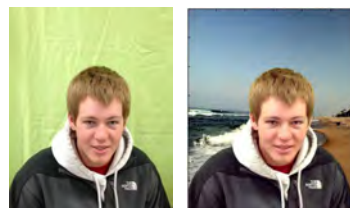
The lady Flyers recently won the A-10 championship for the first time in program history. The team also secured a spot in its third consecutive NCAA tournament. The players showed off their trophy at halftime of the men's first round A-10 tournament game against George Washington.

## ECE 203 Student Project

submitted by Russ Hardie

Students in ECE203 MATLAB Programming, taught by Dr. Russell Hardie in Fall 2011, worked on a green screen video processing project to help develop their programming skills. A green sheet was used as a makeshift backdrop in class. Students used the webcam on their laptops to acquire live video

of themselves in front of a green screen. A custom MATLAB program was written by the students to segment themselves from the green screen in the live video. Next, their program blended their live image into a selected background in real-time.



*Tyler Hohman, (above) .... from Kettering Labs to the beach in real-time.*

*Ryan McCurdy (below), .....body guard for the President??*



## Did you know.....

The University of Dayton, in addition to 3 other universities, has been awarded a grant from the **Kern Family Foundation**. The grant will be used to support intercollegiate projects that allow students to share resources and experiences in new collaborative ways. The grant will be used for preparing entrepreneurially minded engineers.

As part of the **NSF Nanotechnology** Undergraduate Education Initiative, a new elective course on "Introduction to Nanotechnology" will be offered for the first time in the Fall 2012 semester.

**Prof. John Loomis** and his wife went on an Antarctica expedition and returned home safely with amazing pictures!! (*Notice all his little friends in the background?*)



**Prof. Balster's** participation in the Engineering week activities....he was brave enough to be duct taped to the wall by his students!

Before

After



**Find us on Facebook.....**<http://www.facebook.com/pages/Electrical-and-Computer-Engineering-at-the-University-of-Dayton/104122726318040>

## Awards/Honors/Promotions

**Dr. John Malas**, Adjunct Professor, was awarded the 2012 "Dr. Samuel Burka Award" by the AFRL.

**Dr. Partha Banerjee** elected Fellow of Institute of Physics, England.

**Dr. Tarek Taha** has been awarded tenure effective 2012-13 academic year.

**Dr. Qiwen Zhan** has been promoted to the rank of Full Professor effective 2012-13 academic year .

**Dr. Partha Bannerjee** has been selected to receive the 2012 Outstanding Professional Achievement (in research) award by the Affiliate Societies Council of Dayton.

## Alumni Spotlight

**Richard Kutter**, class of '96, a principal electronics engineer in the AFRL Sensors Directorate, WPAFB, was selected from a field of nine IT professionals to win the 2012 GOVTek Excellence in Cyber Security Award from the Government Technology Research Alliance (GTRA) . Congratulations Richard!!

## May 2012 Departmental Outstanding Student Awards

**Alan M. Smith** — Thomas R. Armstrong '38, Award of Excellence for Outstanding Electrical Engineering Achievement

**Evan W. Krieger** — Brother Louis H. Rose, S.M. '33, Award of Excellence to the Outstanding Junior in Electrical & Computer Engineering

**John Wedig** — Anthony Horvath and Elmer Steger, '22, Award of Excellence to the Outstanding Senior in Electrical & Computer Engineering

**Patrice S. Lalor** and **Sara McManus Helton** — Mary C. Millett Endowment Award, Award for the Outstanding Senior in Electrical and Computer Engineering

## ECE Graduates—December 2011



### MS Degrees Awarded

Fares S. Almeahmadi  
Bradley T. Ashmore  
Jie Bai  
Sravani Bandaru  
Yue Bao  
Zhiye Chen  
Megan M. Connor  
Andrew C. Daniel  
Harshavardhan R. Ega  
Marc P. Hoffman  
Julian Daniel John  
Sudheer Kadiyala  
Shashank Kambam  
Sushma Kondapalli

Sravanthi Mannuru  
Kuan-Chang Pan  
Narender Pilli  
Vinay Teja Reddy Poola  
Vasant Kumar Poonamalli  
Sharat C. Pomicherla  
Revanth Tambisetty  
Mahesh Kumar Thakur  
Shu Wang  
Alexander M. Watson  
Mersha W. Woldesilassie  
Yi Xu  
David L. Zeppettella

### BS/BE Graduates

Corey M. Boltz  
Justin W. Bushong  
Christopher J. Bushmeyer  
Kasandra C. Maxwell  
Josph J. McKeon  
Micheal J. Rooths  
Kenneth L. Stapp  
Jarren P. Summers



## 2011 Faculty Publications/ Conferences/ Journals/ Patents

Mohammad Nazrul Islam, Mohammad A. Karim, Mohammad S. Alam, and **Vijayan K. Asari**, "Optical cryptographic system employing multiple reference-based joint transform correlation technique," *SPIE Journal of Optical Engineering*, vol. 50, no. 6, pp. 068202: 1-10, June 2011.

Mohammad Nazrul Islam, , **Vijayan K. Asari**, Mohammad A. Karim, and Mohammad S. Alam, "Distortion-invariant pattern recognition using synthetic discriminant function based multiple phase-shifted-reference fringe-adjusted joint transform correlation," *Journal of Optics Communications*, vol. 284, no. 6, pp. 1532-1539, March 2011.

Theus H. Aspiras and **Vijayan K. Asari**, "Log power representation of EEG spectral bands for the recognition of emotional states of mind," *Proceedings of the 8th International Conference on Information, Communications and Signal Processing - ICICS 2011*, Singapore, TM1.4-P0213: pp. 1-5, 13-16 December 2011.

Binu M Nair, Jacob Foytik, Richard Cortland Tompkins, Yakov Diskin, Theus Aspiras, and **Vijayan K. Asari**, "Multi-pose face detection, recognition and tracking system," *Proceedings of the International Conference on Complex Adaptive Systems - CAS 2011*, Complex Adaptive Systems (*Editor in Chief: Cihan H. Dagli*), Chicago, IL, USA, vol. 1, (Procedia Computer Science, vol. 6), pp. 381-386, 31 October - 02 November 2011.

Jacob Foytik, Praveen Sankaran, and **Vijayan K. Asari**, "Tracking and recognizing multiple faces using Kalman filter and modular PCA," *Proceedings of the International Conference on Complex Adaptive Systems - CAS 2011*, Complex Adaptive Systems (*Editor in Chief: Cihan H. Dagli*), Chicago, IL, USA, vol. 1, (Procedia Computer Science, vol. 6), pp. 256-261, 31 October - 02 November 2011.

Mohammad Moinul Islam, , **Vijayan K. Asari**, Mohammed Nazrul Islam, and Mohammad A. Karim, "Modified local binary pattern (MLBP) for robust face recognition," *Proceedings of the International Conference on Neural Computation Theory and Applications-NCTA 2011: International Joint Conference on Computational Intelligence (IJCCI)*, , Paris, France, pp. 147-152, 24-26 October 2011.

Saibabu Arigela and **Vijayan K. Asari**, "Adaptive and nonlinear techniques for visibility improvement of hazy images," *Lecture Notes in Computer Science*, Published by **Springer, Advances in Visual Computing**, Edited by G. Bebis et al. *Proceedings of the International Symposium on Visual Computing - ISVC - 2011*, Las Vegas, NV, USA, vol. 6939/2011, pp. 75-84, 26-28 September 2011

Minqi Zhou and **Vijayan K. Asari**, "A fast video stabilization system based on speeded-up robust features," *Lecture Notes in Computer Science*, Published by **Springer, Advances in Visual Computing**, Edited by G. Bebis et al. *Proceedings of the International Symposium on Visual Computing - ISVC - 2011*, Las Vegas, NV, USA, vol. 6939/2011, pp. 428-435, 26-28 September 2011

Yakov Diskin, Richard Cortland Tompkins, Menatoallah Youssef, and **Vijayan K. Asari** "UAS exploitation by 3D reconstruction using monocular vision," The 24th International Technical Meeting of the Satellite Division of the Institute of Navigation - ION GNSS 2011: Robust Navigation in GNSS-Denied and GNSS-Challenged Environments , Portland, OR, USA, 20-23 September 2011.

Ann Theja Alex, **Vijayan K. Asari**, and Alex Mathew, "Neighborhood dependent approximation by nonlinear embedding for face recognition," *Lecture Notes in Computer Science*, Published by Springer, Image Analysis and Processing Part I, Edited by Giuseppe Maino and Gian Luca Foresti, Proceedings of the 16th International Conference on Image Analysis and Processing - ICIAP 2011, Ravenna, Italy, vol. 6978/2011, pp. 544-553, 14-16 September 2011.

Qun Wang, Jiang Li, **Vijayan K. Asari**, and Mohammad Karim "3D face reconstruction from limited images based on differential evolution," SPIE International Conference on Optical Engineering + Applications: Applications of Digital Image Processing XXXIV (Conference 8135), San Diego, CA, USA, 21-25 August 2011.

Mohammed Nazrul Islam, **Vijayan K. Asari**, and Mohammad A. Karim "Distortion-invariant face recognition using multiple phase-shifted reference-based joint transform correlation technique," SPIE International Conference on Optical Engineering + Applications: Optics and Photonics for Information Processing V (Conference 8134), San Diego, CA, USA, 21-25 August 2011.

Theus H. Aspiras and **Vijayan K. Asari**, "Analysis of spatiotemporal relationship of multiple energy spectra of EEG data for emotion recognition," *Communications in Computer and Information Science*, Published by Springer, Computer Networks and Intelligent Computing, Edited by K.R. Venugopal and L.M. Patnaik: Proceedings of the Fifth International Conference on Information Processing - ICIP 2011, Bangalore, India, vol. 157, pp. 572-581, 05-07 August 2011.

Alex Mathew, Ann Theja Alex, and **Vijayan K. Asari**, "A linear manifold representation for color correction in digital images," *Communications in Computer and Information Science*, Published by Springer, Computer Networks and Intelligent Computing, Edited by K.R. Venugopal and L.M. Patnaik: Proceedings of the Fifth International Conference on Information Processing - ICIP 2011, Bangalore, India, vol. 157, pp. 652-658, 05-07 August 2011.

Richard Cortland Tompkins, Yakov Diskin, Menatoallah Youssef, and **Vijayan K. Asari**, "3D reconstruction from a monocular vision system for unmanned ground vehicles," *Proceedings of the SPIE Conference on Security and Defense: Electro-Optical Remote Sensing, Photonic Technologies, and Applications V*, Prague, Czech Republic, vol. 8186, pp. 818608: 1-6, 19-22 September 2011.

Minqi Zhou and **Vijayan K. Asari**, "Speeded-up robust features based moving object detection on shaky video," *Communications in Computer and Information Science*, Published by Springer, Computer Networks and Intelligent Computing, Edited by K.R. Venugopal and L.M. Patnaik: Proceedings of the Fifth International Conference on Information Processing - ICIP 2011, Bangalore, India, vol. 157, pp. 677-682, 05-07 August 2011.

## 2011 Faculty Publications/Conferences/Journals/Patents

Nilesh Powar, Jacob Foytik, and **Vijayan K. Asari** "Facial expression analysis using 2D and 3D features," 2011 National Aerospace Electronics Conference (Cognitive Signal Processing and Visualization) - NAECON 2011, Fairborn, Ohio, USA, 20-22 July 2011.

Varun Santhaseelan and **Vijayan K. Asari**, "Phase congruency based technique for the removal of rain from video," Lecture Notes in Computer Science, Published by Springer, , Image Analysis and Recognition, Edited by Mohamed Kamel and Aurélio Campilho, *Proceedings of the 8th International Conference on Image Analysis and Recognition - ICLAR 2011*, Burnaby, BC, Canada, vol. 6753/2011, pp. 30-39, 22-24 June 2011.

Qun Wang, Jiang Li, **Vijayan K. Asari**, and Mohammad Karim "2D face database diversification based 3D face modeling," *Proceedings of the SPIE International Conference on Applications of Optics and Photonics, Braga, Portugal, SPIE 8001, 80010M (2011)*; doi:10.1117/12.894605, 3-7 May 2011.

Theus Aspiras and **Vijayan K. Asari**, "Wavelet domain analysis of EEG data for emotion recognition: evaluation of recourcing energy efficiency," *Proceedings of SPIE Conference on Defense, Security, and Sensing: Independent Component Analyses, Wavelets, Neural Networks, Biosystems, and Nanoengineering IX, Orlando, Florida, USA, vol. 8058, 805818 (2011)*, doi:10.1117/12.884074, 25-29 April, 2011.

Binu Nair and **Vijayan K. Asari**, "Action recognition based on multi-level representation of 3D shape," *Proceedings of the 6th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications (VISIGRAPP): International Conference on Computer Vision Theory and Applications - VISAPP 2011*, Algarve, Portugal, pp.378-386, March 2011..

Theus Aspiras, Kelly Cashion, **Vijayan K. Asari**, and Nicole Arbuckle, "Spatiotemporal analysis of EEG signals using source localization methods," Biomedical Imaging in Greater Dayton Conference - IMIGD, Dayton, OH, USA, 26 September 2011.

Theus Aspiras, Kelly Cashion, **Vijayan K. Asari**, and David Kancler, "Dense array electroencephalograph data analysis for emotion recognition and brain machine interfacing," Biomedical Imaging in Greater Dayton Conference - IMIGD, Dayton, OH, USA, 26 September 2011

Nilesh Powar, Jacob Foytik, and **Vijayan K. Asari**, "Facial expression analysis using 2D and 3D features," Biomedical Imaging in Greater Dayton Conference - IMIGD , Dayton, OH, USA, 26 September 2011.

Yakov Diskin, Richard Cortland Tompkins, Menatoallah Youssef, and **Vijayan K. Asari**, "3D scene reconstruction using monocular vision," Ohio Innovation Summit: Sensor Field Day, Dayton, OH, USA, 16 June 2011.

Varun Santhaseelan and **Vijayan K. Asari**, "Detection and removal of rain in video using phase space analysis," Ohio Innovation Summit: Sensor Field Day, Dayton, OH, USA, 16 June 2011.

Saibabu Arigela and **Vijayan K. Asari**, "Luminance based adaptive technique for visibility improvement of hazy/foggy images," Ohio Innovation Summit: Sensor Field Day, Dayton, OH, USA, 16 June 2011.

D. J. Lucking, **E. J. Balster**, K. L. Hill, and F. A. Scarpino. "FPGA Implementation of the JPEG2000 MQ Decoder", *Journal of Real-Time Image Processing*, vol. 6, online first, 19 July 2011.

**E. J. Balster**, B. T. Fortener, and W. F. Turri. "Integer Computation of Lossy JPEG2000 Compression". *IEEE Transactions on Image Processing*, vol. 20, no. 8, pp. 2386-2391, August 2011.3. N. Sharma, J. Zhu, Y. F. Zheng, and E. J. Balster. "Arbitrarily Shaped Virtual-Object Based Video Compression", *Journal of Multimedia Tools and Applications*, vol. 55, online first, Sept. 2011.

**E. J. Balster**, B. T. Fortener, and W. F. Turri. "Post Compression Rate-Distortion Development for Embedded Block Coding with Optimal Truncation in JPEG2000 Imagery", *Int. Journal of Image and Graphics*, vol. 11, pp. 611-627, Oct. 2011.

M. P. Hoffman, **E. J. Balster**, F. A. Scarpino, and K. Hill. "An Efficient Software Implementation of the CAVLC Encoder for H.264/AVC", In *Proc. IEEE National Aerospace and Electronics Conference*. Dayton, OH, July 20-22, 2011.

**E. J. Balster**, B. T. Fortener, A. M. Kordik, and T. A. Marrara. "Sub-Optimal Truncation in JPEG2000 Imagery for Rate Control and High Compression Throughput", In *Proc. IEEE National Aerospace and Electronics Conference*. Dayton, OH, July 20-22, 2011.

**M.R. Chatterjee** and M.A. Al-Saedi, "Examination of chaotic signal encryption and recovery for secure communication using hybrid acousto-optic feedback," **Opt. Eng.** 50(5),0055002( May 2011).

**M.R. Chatterjee** and M.A. Al-Saedi, "Chaotic bandgaps in hybrid acousto-optic feedback and their implications," **Proc. SPIE**,8162,8162J(2011).

M.A. Al-Saedi and **M.R. Chatterjee**, "Examination of the nonlinear dynamics of a chaotic acousto-optic bragg modulator with feedback under signal encryption and decryption." **Opt. Eng.** 51, 018003 (Feb. 06, 2012).

**M.R. Chatterjee**, "Rabindranath Tagore: Enduring Founder of a Culture," essay appearing in *Rabindranath Tagore: A Timeless Mind*, pp. 49-56, published by The Tagore Centre, London, and the Indian Council for Cultural Relations

**R. C. Hardie**, K. J. Barnard, R. Ordonez, "Fast super-resolution with affine motion using an adaptive Wiener filter and its application to airborne imaging," *Optics Express* Vol. 19, Iss. 27, pp. 26208-26231 (2011).

## 2011 Faculty Publications/ Conferences/ Journals/ Patents

- R. C. Hardie**, D. R. Droege, and K. M. Hardin, "Real-Time Atmospheric Turbulence with Moving Objects," Proceedings of MSS Passive Sensors, Orlando, FL, February, 2011.
- R. C. Hardie**, P. C. Hytla, and D. P. Rafferty, "Super-Resolution for the Open Skies RCD105 Bayer Color Camera," UDRI white paper for Open Skies Image Enhancement Study, Feb. 25, 2011.
- R. C. Hardie**, P. C. Hytla, and D. P. Rafferty, "Super-Resolution for the Open Skies DMC Framing Camera," UDRI white paper for Open Skies Image Enhancement Study, May 10, 2011.
- R. C. Hardie**, D. A. LeMaster, and B. M. Ratliff, "Super-resolution for imagery from integrated microgrid polarimeters," *Optics Express*, Vol.19, Issue 14, 12937-12960(2011).
- K. Hirakawa**, P.J. Wolfe, "Rewiring Filterbank for Local Fourier Analysis: Theory and Application," *IEEE Trans. Information Theory*, August, 2011
- V. Ramachandra, **K.H.**, M. Zwicker, T.Q. Nguyen, "Spatio-Angular Prefiltering for Multiview 3D Displays," *IEEE Trans. Visualization and Computer Graphics*, May, 2011.
- A. Chakrabarti, **K. Hirakawa**, T. Zickler, "Computational Color Constancy with Spatial Correlations," *IEEE Trans. Pattern Analysis and Machine Intelligence*, to appear.
- K. Hirakawa**, P.J. Wolfe, "Skellam Shrinkage: Wavelet-Based Intensity Estimation for Inhomogeneous Poisson Data," *IEEE Trans. Information Theory*, to appear.
- K. Hirakawa**, P. Simon, "Single-Shot High Dynamic Range Imaging with Conventional Camera Hardware," *IEEE International Conference on Computer Vision*, 2011.
- K. Hirakawa**, J. Gu, "High Resolution Subpixel and Subframe Rendering For Color Flatpanel and Projector Displays," *IEEE International Conference on Image Processing*, 2011
- K. Hirakawa**, "Spectral Filter Array Design For Multispectral Image Recovery," *IAPR Computational Color Imaging Workshop, Italy*, 2011.
- K. Hirakawa**, "Multispectral Filter Array," *Gjovik Color Imaging Symposium, Norway*, 2011
- T. Gevers, **K. Hirakawa**, J. van de Weijer, "Color image understanding from acquisition to high-level image understanding," *IEEE International Conference on Computer Vision*, 2011.
- R. C. Hardie, K. J. Barnard, **R. Ordonez**, "Fast super-resolution with affine motion using an adaptive Wiener filter and its application to airborne imaging," *Optics Express* Vol. 19, Iss. 27, pp. 26208-26231 (2011).
- C. Zhang, **Ordóñez R.**, "Extremum Seeking Control and Applications - A Numerical Optimization Approach," Springer, Oct. 2011.
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