University of Central **Florida**

Computer VISION

Two Memorandums of Understanding are Signed

UCF Enters Into Agreements With NUST & MUET

This year, the Computer Vision Lab is happy to announce that we have entered into agreements with two universities in Pakistan. These International Agreements are the legal documents that formalize the relationship between institutions.

International partnerships are one of the most effective means to internationalize a university. They directly further three of the University of Central Florida goals:

1. Achieve international prominence in key programs of graduate study and research.
2. Provide international focus to our curricula and research programs
3. Be America's leading partnership university.

The Vice Chancellor of Mehran University of Engineering and Technology (MUET), Prof. Dr. A.Q.K. Rajput and his Registrar, Mr. Aslam Uqaili, visited the University of Central Florida in late April to meet with administrative officials and sign the first Memorandum of Understanding.

MUET believes in establishing a conducive environment for top of the class professional education and research. They aim to produce quality professionals who uphold and advance the integrity, honor, and dignity of their profession, while taking active part in the development of society.

On August 31, 2006 the National University of Sciences & Technology (NUST) sent General Hamid Mahmud and Dr. Noman Jafri to Orlando as delegates to bring the second scientific and technical collaboration to a start. The visit also provided the delegates with an opportunity to tour the campus, and in particular, the Computer Vision Lab.

NUST is one of the new generations of Pakistani Universities with a progressive and innovative outlook. The university is envisaged to grow as a modern centre of excellence for research and development in the fields of sciences and technology. The essence underlying the foundation of NUST revolves around

spectral combination of engineering, information technology (IT), medical and management sciences with higher academic quality and spirit of excellence epitomizing its cherished objective. NUST is committed to the provision of intellectual leadership and development.

The first students sponsored under the agreement with NUST will begin study at the University of Central Florida in the 2007-2008 academic year. In 2007, UCF hopes to enter into an inter-university Twinning Agreement with NUST that will establish a split degree program where the graduate degree is awarded at UCF.

Visitor Under MOU

Javed Ahmed, a Ph.D. student at the National University of Sciences and Technology, came to UCF under the Memorandum of Understanding with his university. Although he only planned to visit the Computer Vision Lab for six months his stay was extended to eight months. Dr. Shah said of Javed, "He has been performing extremely well." In his time at UCF, Javed submitted one revised journal paper which has been accepted, another one is under review, and the third one is under preparation.

Regarding his visit, Javed said "If a person sits in a shop of perfumes his clothes become a little fragrant at the end of the day, even when he does not explicitly apply any perfume on his clothes. Similarly, when I came here from Pakistan, sat in the world-famous Computer Vision Lab and worked collaboratively with active researchers, I feel myself enriched with the new ideas and current trends of research in the field." He continued on to say "I definitely owe Dr. Mubarak Shah for inviting me".

Computer Vision Lab
University of Central Florida

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Alexei Gritai
Asaad Hakeem
Min Hu
Saad Khan
Jingen Liu
Merrill McKee
Omer Orhan
Vladimir Reilly
Mikel Rodriguez
Imran Saleemi
Paul Scovanner

M.S. Students

Yusuf Aytar
Phillip Berkowitz
Ryan Faircloth
Eric Leach

B.S. Students

Aysenur Basagalar
Emine McDonald
Andrew Miller
Delia Torres
Brandyn White
Eric White
Tommy Williams

CV Lab Hosts Visiting Scholars

Supported by the government of the People's Republic of China, Professor Jianjun Huang came to UCF as a Visiting Scholar to study with the Computer Vision Lab for six months. His stay will extend from October 2006 through May 2007. Multimedia information retrieval and machine learning are among his research interests and he currently is an associate professor at the School of Mathematics and Computer Science at Fuzhou University.

When asked about his opportunity to work with the Computer Vision Lab, Huang said "I feel that we can benefit and further our studies by communicating and exchanging ideas." Four months into his stay, Prof. Huang had this to say about his visit, "It has been an extremely valuable and enriching experience to be a part of the research group at the Computer Vision Lab, UCF. With the help provided by the knowledgeable professor, Dr. Mubarak Shah, and many others, I have gained a lot."

The Computer Vision Lab is also hosting Sohail Sattar from NED University, Karachi, Pakistan. His visit is financed under the MoST Endowment Fund in Pakistan which allows research scholars to visit UCF for two six months period. Sohail's stay will extend through April 2007, and he will be working to complete his project titled "A Technique for the Design and Implementation of an OCR for Printed Nastalique Text."

When asked about his experience thus far, Sohail said "It has been an immense pleasure working at the Computer Vision Lab at UCF and an absolutely unique and thrilling experience to work with the most cooperative and extremely genial and supportive group of colleagues.   My learning experience has been enriched and strengthened by the great encouragement and guidance provided by my most respected supervisor, Dr. Mubarak Shah."

Back: Omer Bilal, Adeel Ali, Tommy Williams, Eric White, Andrew Miller, Ryan Faircloth, Phillip Berkowitz, Paul Scovanner, Vlad Reilly, Saad Khan, Merrill McKee
Center: Eric Leach, Pingkun Yan, Javed Ahmed, Mubarak Shah, Arslan Basharat, Saad Ali, Sohail Sattar, Pavel Babenko, Min Hu
Front: Jun Xie, Mikel Rodriguez, Jim Liu, Yusuf Aytar, Alexei Gritai, Hassan Abbas, Jianjun Huang

Computer Vision Distinguished Speaker Series

2006 Brings Another Wave of Speakers

In 2005, the Computer Vision Lab at UCF established the Computer Vision Distinguished Seminar Series to encourage the exchange of ideas within this discipline. The inaugural year of this series brought names like Drs. Jake Aggarwal, Rama Chellappa and Takeo Kanade. When creating this series, it was our intention to invite top researchers from all over the world to come to Orlando to make presentations on recent advances in the field of computer vision, and spend time with the vision group.

In an effort to continue the tradition of distinguished speakers, the Computer Vision Lab was happy to host Dr. Jitendra Malik of the University of California at Berkeley in January. Prof. Malik presented a talk on *Recognizing Objects and Actions in Images and Video* that showed results on a variety of 2D and 3D recognition problems.

The head of the Computer Vision Group at ETH in Zurich, Prof. Luc Van Gool, gave a talk entitled *Total Recall: A Plea for Realistic 3D Reconstruction of Cultural Heritage* in February. Here, he presented methods that have been developed at the University of Leuven and ETH Zurich to alleviate the problem of cost when it comes to the creation of 3D models of cultural monuments and archaeological sites.

Prof. Luc van Gool

In March, Dr. Thomas Huang of the University of Illinois at Urbana-Champaign gave a talk on. *Vision-Based Hand Gesture Tracking and Recognition.* Results in the last decade motivated by applications in human-computer interaction such as display control in virtual environments and the manipulation of virtual objects were presented.

A Vision of Vision was presented by Dr. Allen Hanson of the University of Massachusetts in April. Prof. Hanson is Co-Director of the Computer Vision Laboratory at the University of Massachusetts which was established in 1974. Relevant aspects of the research done at UMass on issues surrounding the construction of integrated vision systems that are capable of functioning flexibly and robustly in complex changing environments were presented.

Prof. Tom Huang

The new academic year brought even more distinguished speakers to UCF. Dr. Amnon Shashua of The Hebrew University of Jerusalem visited in September. His talk, *The Role of Multi-Linear Constrained Factorization in Image Coding and Visual Learning,* presented a bird's eye view of novel connections between the task of factorizing measurements arranged in multi-way arrays to problems in image coding, clustering, multi-body segmentation and general latent class model used in various inference tasks.

Prof. Allen Hanson

Next, Dr. Zhengyou Zhang of Microsoft Research came to UCF in October and presented *Computer Vision for Real-Time Communication and Human-Computer Interaction.* This talk focused on vision related projects from Dr. Zhang's research over the past twenty years which included face modeling, eye-gaze correction for video conferencing, distributed meetings, and whiteboard technology.

Dr. Anil Jain of Michigan State University brought the second year of the Computer Vision Distinguished Speaker Series to a successful end with his visit in November in which he presented *Biometric Recognition: How Do I Know Who You Are?* Prof. Jain talked about the challenges in designing robust and secure biometric systems, state-of-the-art recognition performance and fusion strategies for multi-modal biometric systems.

The Computer Vision Lab is looking forward to hosting Drs. Ted Adelson, David Lowe, Gerard Medioni and James Duncan during the remainder of the academic year with more to come in 2007.

Videos of these talks will be posted to the Computer Vision Lab's website for viewing in the near future. For more information on this series and to view the schedule of upcoming speakers, please visit http://www.cs.ucf.edu/~vision/ and click on Distinguished Speakers.

Marshall Tappen Joins UCF

Dr. Marshall Tappen is the newest Computer Vision Lab faculty member at the School of Electrical Engineering & Computer Science. Marshall completed his Ph.D. in 2006 in the Computer Science and Artificial Intelligence Laboratory at the Massachusetts Institute of Technology. He graduated with a B.S. in Computer Science from BYU in 2000 and received an M.S. degree in Electrical Engineering and Computer Science from MIT in 2002. He is the recipient of the National Defense Science and Engineering Graduate (NDSEG) Fellowship. At UCF he taught his first course, CAP 5415 Computer Vision, in the Fall 2006 semester, and is teaching CAP 6412 Advanced Computer Vision in Spring 2007. He is in the process of establishing his research group and is also contributing to the *Content Extraction for Analysis of Ground Reconnaissance Videos* project funded by DTO.

SPREF: Spatio-temporal Regularity Flow

In Memory of Orkun Alatas:
Developer of this novel technique

The Computer Vision Lab at UCF has introduced a general framework to extract a new feature, SPatiotemporal REgularity Flow (SPREF), that has been successfully applied to several fundamental video processing applications. SPREF is a 3D vector field representing the directions in which a video is regular, i.e., the pixel appearances change the least, which can be estimated by minimizing a formulated energy function over a spatiotemporal volume. A compact, smooth and robust SPREF representation can be obtained by using spline approximation of the estimated vectors as shown in Figure 1.
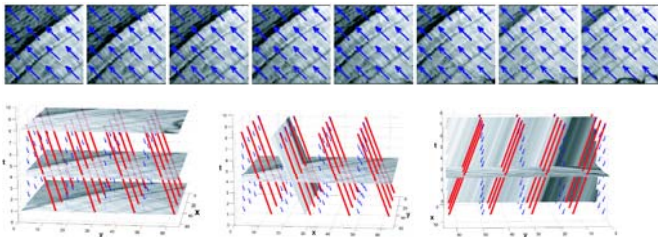

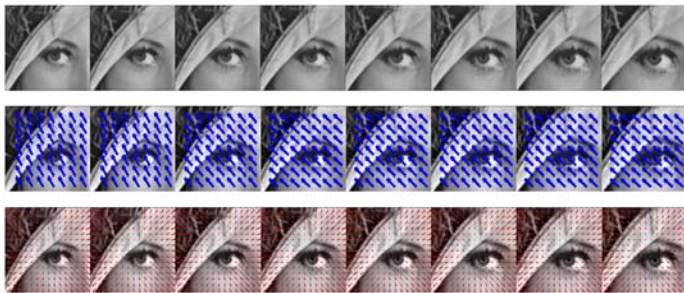Figure 1. A video sequence and the 3D SPREF.

Figure 2. (First row) Zooming synthetic sequence, (second row) stimated T-SPREF and (third row) A-SPREF field.

Two types of SPREFs have been developed based on two different flow models, translational (T-SPREF) and affine (A-SPREF). In the T-SPREF model, the flows are approximated by block translations orthogonal to the directions of flow propagation, which gives good results when the direction of regularity of the spatiotemporal region is a function of the flow propagation axis. The flow model can be changed to affine when the directions of regularity depend on multiple axes. A few examples of usage of SPREF are demonstrated here, see below for more details:

♦ *Orkun Alatas, Omar Javed and Mubarak Shah, "Video Compression Using Spatiotemporal Regularity Flow", IEEE TIP, Vol. 15, No. 12, pp. 3812-3823, December 2006.*
♦ *Orkun Alatas, Pingkun Yan and Mubarak Shah, "Spatiotemporal Regularity Flow (SPREF): Its Estimation and Applications", IEEE Transactions on Circuits and Systems for Video Technology (in press).*
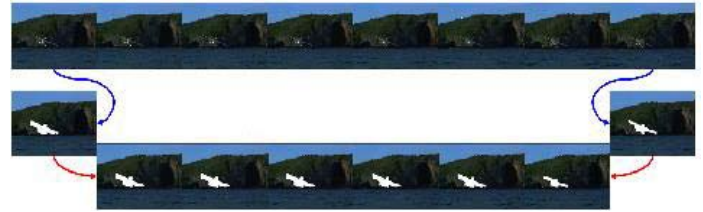
Figure 3 Application of SPREF to Object Removal.

The time consuming manual work of object removal can be significantly decreased by using the SPREF, where the manual selection is only required for the first and the last frames of the GOF as shown in Figure 3. Compared to the way of manual selection in each frame, the amount of manual work has been reduced by 75%.
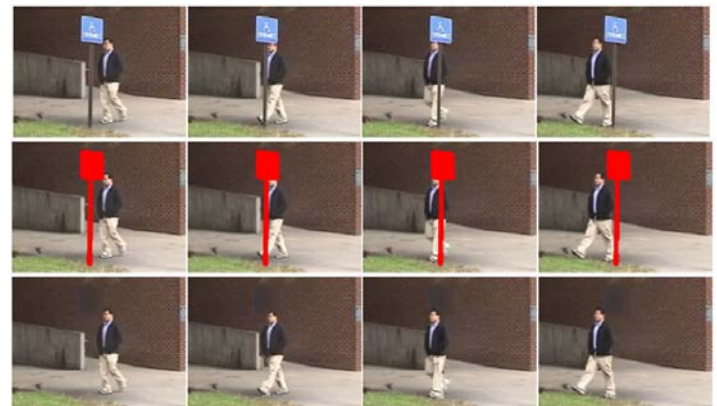

Figure 4. Application of SPREF to video inpainting.

The problem of video inpainting can be solved by using SPREF since the regularity of a spatiotemporal region is modeled explicitly. The first row of Figure 4 shows a clip from a walking human sequence in which a man is partly occluded by a sign board. In the second row, the sign board is removed and we need to inpaint the hole marked by red. Then we perform the inpainting along the flow curves with interpolation and/or extrapolation and our inpainting results are shown in the third row of Figure 4.

The efficiency of the video compression can be increased by filtering a spatiotemporal region along the directions of regularity as estimated by SPREF. In addition, the compactness of SPREF due to the spline representation has a low compression overhead. Thus, SPREF is a very suitable tool for video compression. We have achieved significant improvement in compression rate over traditional wavelets based approaches.

2006 Publications

CONFERENCES

Yun Zhai and Mubarak Shah, "Visual Attention Detection in Video Sequences Using Spatiotemporal Cues", *ACM Multimedia 2006*, Santa Barbara, CA, USA.

Humera Noor, Shahid H. Mirza, Yaser Sheikh, Amit Jain and Mubarak Shah, "Model Generation for Video Based Object Recognition", *ACM Multimedia 2006*, Santa Barbara, CA, USA.

Yaser Sheikh, Niels Haering and Mubarak Shah, "Shape from Dynamic Texture for Planes", *IEEE Conference on Computer Vision and Pattern Recognition, R 2006*, New York, NY, USA.

Saad M. Khan and Mubarak Shah, "A Multiview Approach to Tracking People in Crowded Scenes using a Planar Homography Constraint", *European Conference on Computer Vision, 2006.*

Alexei Gritai and Mubarak Shah, "Tracking of Human Body Joints Using Anthropometry", *ICME*, Toronto, Canada, 2006.

Yun Zhai, Jingen Liu and Mubarak Shah, "Automatic Query Expansion In News Video Retrieval", *ICME*, Toronto, Canada, 2006.

Saad M. Khan, Fahd Rafi and Mubarak Shah, "Where was the picture taken: Image Localization in Rout Panoramas Using Epipolar Geometry", *ICME*, Toronto, Canada, 2006.

Asaad Hakeem, Roberto Vezzani, Rita Cucchaira, Mubarak Shah, "Estimating Geospatial Trajectory of a Moving Camera", International Conference on Pattern Recognition, Hong Kong, August 23, 2006.

Jun Xie, Pheng-Ann Heng, Simon S., M. Ho, Mubarak Shah, "Image Diffusion Using Saliency Bilateral Filter", 9th MICCAI Conference, October 1-6, 2006, Copenhagen.

Pingkun Yan and Mubarak Shah, "Segmentation of Neighboring Structures by Modeling Their Interaction," IEEE Computer Society Workshop on Mathematical Methods in Biomedical Image Analysis, New York, June 2006.

JOURNALS

Alper Yilmaz, Omar Javed and Mubarak Shah, "Object Tracking: A Survey", ACM Computing Surveys, December 2006.

Alper Yilmaz and Mubarak Shah, "Matching actions in presence of camera motion", Computer Vision and Image Understanding, Vol. 104 (2006), pp. 221231.

Orkun Alatas, Omar Javed and Mubarak Shah, "Video Compression Using Spatiotemporal Regularity Flow", IEEE Transactions on Image Processing, Vol. 15, No. 12, pp. 3812-3823, December 2006.

Xiaochun Cao, Jiangjian Xiao, Hassan Foroosh, and Mubarak Shah, "Self-Calibration from Turn-Table Sequences in the Presence of Zoom and Focus", Computer Vision and Image Understanding, 102 (2006) 227-237.

Eraldo Ribeiro and Mubarak Shah, "Computer Vision for Nanoscale Imaging", *Machine Vision and Applications Journal*, Vol. 17, Issue 3 (July 2006), pp. 147 - 162.

Lisa Spencer and Mubarak Shah, "Determining Scale and Sea State from Water Video", IEEE Transactions on Image Processing, , Vol. 15, No. 6, 2006.

Yun Zhai and Mubarak Shah, ``Video Scene Segmentation Using Markov Chain Monte Carlo'', IEEE Transaction on Multimedia, Vol.8, issue 4 (Aug 2006), pp.686-697.

Paul Smith; Mubarak Shah; Niels Lobo, "Integrating Multiple Levels of Zoom to Enable Activity Recognition", CVIU, Vol. 103, Issue 1 (July 2006), pp.33-51.

INVITED TALKS

Mubarak Shah, "Recognizing Human Actions", Lahore University of Management Sciences, Lahore, Pakistan, January 5, 2006.

Mubarak Shah, Tracking Across Multiple Moving Cameras", Military College of Signals, Islamabad, January 6, 2006.

Mubarak Shah, "Human Action Recognition", Princeton University on Monday, April 10, 2006.

Mubarak Shah, "Advances in Video Understanding Research", Weissberger/Williams Lecture Series, Kodak Research, April 12, 2006, Rochester, New York

Mubarak Shah, "The Fundamental Matrix in Human Action Recognition", Azriel Rosenfeld Lecture at University of Maryland, April 30-May 2, 2006.

Mubarak Shah, "The Fundamental Matrix in Human Action Recognition", Wright State University May 4, 2006.

Mubarak Shah, "Recognizing Human Actions", plenary talk at ELMAR-2006, Zadar, Croatia, June 7, 2006.

Mubarak Shah, "Tracking Across Multiple Moving Cameras", Keynote Speech at Computer Vision, Graphics, and Image Processing Conference (CVGIP), Ta Shi,, Taiwan, August 13-15, 2006.

Mubarak Shah, "Recognizing Human Actions From Video Sequences", Asia University, Taichung, Taiwan, August 15, 2006.

Mubarak Shah, "The Fundamental Matrix in Human Action Recognition" AIST, Tsukuba, Japan, August 17, 2006.

Mubarak Shah, "The Fundamental Matrix in Human Action Recognition", Tsukuba University, Japan, August 18, 2006.

Mubarak Shah, "Tracking Across Multiple Moving Cameras", Plenary Talk at International Conference on Image Analysis and Recognition (ICIAR), Povoa de Varzim, Portugal, September 16-20, 2006.

Mubarak Shah, "Spatiotemporal Regularity Flow: (SPREF): Its Estimation and Applications", Workshop on Computational/Compressed Imaging, Lockheed Martin, Orlando, FL, September 26, 2006.

Mubarak Shah, "Video Understanding", BCC Fast, Karachi, Pakistan December 18, 2006.

Mubarak Shah, "Spatiotemporal Regularity Flow", Frontier of Information Technology (FIT2006), Islamabad, Pakistan, December 20, 2006 (plenary talk).

Yilmaz Joins Ohio State

Dr. Alper Yilmaz

Dr. Alper Yilmaz joined the Computer Vision Lab at UCF in the Spring of 2000. As a fresh graduate student far from his beloved hometown in Turkey, Alper found a new home in sunny Florida. He recalls his early days, "… the warmth and kindness of Prof. Shah and new friends at the laboratory made me feel right at home. They even helped me find an apartment to live."

After completing his Ph.D., Alper continued his research working as a Post-doc with Dr. Shah. During this time, he acquired the necessary skills that were critical to obtain his job as an Assistant Professor at Ohio State University in the Fall of 2006. "Professor Shah inspired me to be a leader rather than a follower. Working on multiple tracks including conducting research, writing grant proposals, working on funded projects and teaching advanced graduate courses, was a grueling routine that I successfully mastered with the continued support and encouragement of Prof. Shah. The final result has been very rewarding as I've achieved my dream job as a Professor at a reputed University."

Fulbright Scholar Joins Lab

Yusuf Aytar

The Fulbright program aims to increase mutual understanding between the people of the United States and other countries, through the exchange of persons, knowledge, and skills. Yusuf Aytar, a Fulbright scholar from Turkey, joined the Computer Vision Lab at UCF in the Fall of 2006. Before joining UCF, he did an internship at Siemens Corporation in New Jersey during summer of 2006. He completed his BS from Ege University, in Turkey in 2005.

Yusuf's research is focused on high-level inference and semantic analysis of video data. Describing his experience at the lab Yusuf says, "This is my first experience working collectively with such a large group of research scholars. Many of them come from different parts of the world giving the Lab a very unique mixture of different cultures and research interests. I have already learned so much from this group both academically and culturally. Once an officer from the Fulbright organization told me the Fulbright is like a big family, now I think I have two big families."

State Science & Engineering Fair

Our lab has contributed over the years towards mentoring high school students in the area of computer vision to encourage and support young scientists. In 2006, Chris R. Bethel who is a senior and Elizabeth A. Ennis who is a junior at Lake Brantley High School, in Altamonte Springs, FL worked on software for automated detection of abandoned luggage in surveillance videos. Arslan Basharat, a Ph.D. student in the Computer Vision Lab, mentored Chris and Elizabeth, and worked closely with them to understand and develop the software. The two students participated in the County Science Fair where they won first place. From there, they advanced to the Florida State Science & Engineering Fair where they were awarded 3rd place in the senior team category. The pair then made it to the 2006 Intel International Science and Engineering Fair (ISEF) presented by Agilent Technologies in Indianapolis in May of 2006. Both students and their families were very excited about the opportunity and appreciated the help from the Computer Vision Lab. Chris and Elizabeth are currently working on the improved version for the fair in 2007.
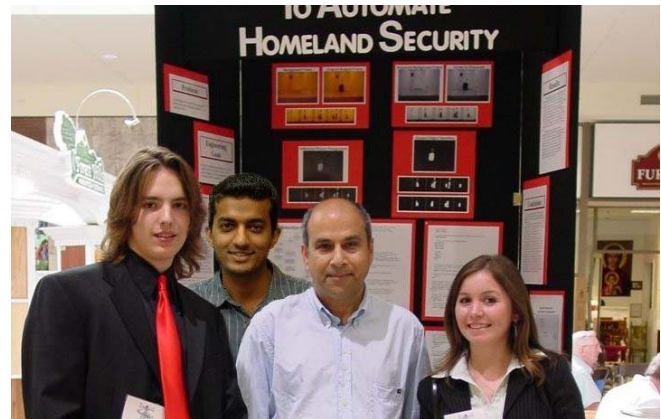
(Left to right) Chris Bethel, Arslan Basharat, Mubarak Shah, Elizabeth Ennis
Regional Science Fair

IAPR Elects Shah as Fellow

In 2006, Mubarak Shah was elected a fellow of IAPR for his contribution to motion-based recognition and Shape from Shading. The award was presented to him during the International Conference on Pattern Recognition held in Hong Kong in August. The prestigious IAPR Fellow Award was introduced in 1994 to acknowledge distinguished contributions of IAPR members to the field of pattern recognition and to IAPR activities. According to the Constitution and Bylaws of IAPR, the number of fellows elected biennially must not exceed .25% of the total IAPR membership.

The International Association for Pattern Recognition is an international association of non-profit, scientific or professional organizations concerned with pattern recognition, computer vision, and image processing in a broad sense. The aims of IAPR are to promote pattern recognition and the allied branches of engineering together with the related arts and sciences, to advance international co-operation in the field of interest to stimulate research, development, and the application of pattern recognition in science and human activity, to further the dissemination and exchange of information on pattern recognition in the broad sense, and to encourage education in all aspects of the field of interest.

IAPR

Shah Wins Pegasus Professor Award for 2006

On April 5, 2006, Dr. Mubarak Shah won the University of Central Florida Pegasus Professor Award for 2006. The Pegasus Professor is the most prestigious honor for UCF faculty members and was presented to Shah during UCF's annual Founder's Day ceremony. Shah is the tenth winner of the Pegasus Professor Award, and the first ever receiving this award in the College of Engineering and Computer Science. The award was first given out in 2000 to recognize sustained excellence in teaching, research, and service. In his speech honoring Dr. Shah, UCF President John Hitt said, "The Pegasus Professor Award honors a faculty member who goes beyond the ordinary and who consistently delivers an extraordinary level of excellence in teaching, research, and service to our students, our community, and to the profession."

"Mubarak has very high standards for himself, for his students, for me and other faculty," Issa Batarseh, Director of the School of Electrical Engineering and Computer Science, wrote in supporting Shah for the award. "He always strives for excellence." Dr. Jiangjian Xiao , a former student, said in the letter "…Dr. Shah is my life model and I really adore his integrity, creativity, and constant enthusiasm."

Funding Trend Continues into 2006

In 2006, the Computer Vision Lab continued its impressive track record of achieving large amounts of research grants. For the second year in a row, Dr. Shah was inducted into the UCF Millionaires' Club and was also recognized for bringing in the most external funding in the entire College of Engineering & Computer Science. The Computer Vision Lab won two contracts under Phase III of the VACE (Video Analysis and Content Extraction) program by Disruptive Technology Office. These included a Tier-I contract on *Content Extraction for Analysis of Ground Reconnaissance Videos* and a Tier-II contract on *Video Analysis and Contract Extraction* jointly with PercepTek (a Colorado based company), the University of Wyoming, and Drexel University. We also received funding from Eastman Kodak on *Consumer Video Retrieval* and from Lockheed Martin Integrated Systems for *UAV Video Analysis*. Dr. Shah also led a multi-disciplinary proposal on *Florida Imaging Sciences Center* under the State of Florida's Centers of Excellence program. This proposal was selected after the first round of competition, but was not ultimately funded.
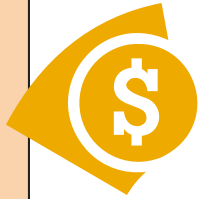
Computer Vision Lab 2006 Graduates

Yaser Sheikh

In May 2006, after five years of hard work and diligence, Yaser Sheikh graduated from UCF with his Ph.D. His dissertation, entitled *Co-operative Visual Sensing in Planar Scenes*, presented "a unifying probabilistic framework that captures the underlying geometry of planar scenes, and proposed algorithms to estimate geometric relationships between different cameras, which are subsequently used for global association of objects."

While at UCF, Yaser published two book chapters, three journal papers and several conference/workshop papers based on his research, including papers accepted for ICCV, ICPR, CVPR, and other prestigious conferences. In 2004, Yaser was a recipient of the Hillman Fellowship for Research Excellence in the Computer Science Ph.D. program.

Yaser is now a Postdoctoral Fellow under Professor Takeo Kanade at the Robotics Institute of Carnegie Mellon University.

Yun Zhai

Yun Zhai became the most recent member of the Computer Vision Lab to obtain his Ph.D. by graduating in August 2006. Yun defended his dissertation, entitled *Video Content Exploitation by Structuring, Linking and Attention Detection*, on July 7, 2006. Yun began his Ph.D. studies in 2001 after obtaining his B.Sc. at Bethune-Cookman College.

During his research career at UCF, Yun published two journal papers (with another under review) as well as sixteen conference papers, including ICCV, ACM Multimedia, and ICPR. His paper entitled "Video Scene Segmentation Using Markov Chain Monte Carlo" appeared in *IEEE Transactions on Multimedia*. Yun's research interests concentrated on computer vision, multimedia processing and content-based image and video retrieval of video sequences.

Yun recently moved to New York to begin work with the IBM Thomas J. Watson Research Center at York Town Heights.

Research Experience for Undergraduates and Teachers

2006 was the twentieth year the Computer Vision Lab at UCF hosted a national site for Research Experiences for Undergraduates (REU) funded by the National Science Foundation. Drs. Mubarak Shah and Niels da Vitoria Lobo serve as co-PIs for this grant. This year, eleven undergraduate students from six Universities (UC Berkeley, CMU, University of Wisconsin at Madison, Boston University, Kennesaw State University and UCF) participated in the program.

Two undergraduates, one each from IIT Kharagpur (Ravi Aggarwal) and IIT Kanpur (Reetu Raj) in India, also did their summer internships at the Computer Vision Lab.

In addition to being an REU site, the Computer Vision Lab was awarded a Research Experience for Teachers (RET) supplement by NSF in which Drs. Shah, Lobo and Orooji were co-PIs. The RET program supports the active involvement of K-12 teachers and community college faculty in engineering research in order to bring knowledge of engineering and technological innovation into their classrooms. Two high school teachers: Charles Percival of Pine View School in Sarasota, FL and Timothy Gallagher of Winter Springs High School in Winter Springs, FL were participants in this year's 8-week summer program.

R.E.U. SUMMER 2006

Computer Vision Lab at UCF Makes a Move

At 8:00am on Friday, October 6th, 2006 the Computer Vision Lab officially closed its doors in the Computer Science Building where they have been located for the last ten years. The lab reopened its doors in the new Harris Corporation Engineering Center. The move helped alleviate overcrowding in the lab and has even given us more space for our rapidly growing group!

The Computer Vision group is now occupying two adjacent labs 254 and 234 in this new building.

Harris Corporation, an international communications technology company, headquartered in Central Florida donated $3 million to the College of Engineering & Computer Science. The donation, along with an additional $3 million in state matching funds helped to equip research laboratories in the new, four-story, 100,000 square foot building. The Computer Vision Lab has a long term relationship with Harris where several of our graduates hold positions of leadership. Harris has funded vision research over the years. Dr. Shah spent his first ever sabbatical at Harris during the 1998-1999 academic year.

President Hitt & Dean Gallagher accept Harris donation

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