



"Developing Outstanding Ideas and Individuals... One at a time."

ARG Alumni Newsletter Summer '07

1. Greetings

Hello again ARG alumni! It has been a while since we've been in contact and I apologize. Between serving on a couple strategic planning committees, running the MechSE department search committee, serving on the campus promotion & tenure committee, being a thrust leader and ex comm member on 2 NSF Engineering Research Centers (ERC's), and a myriad of other things, this winter got a bit hectic and I wasn't able to get out a Winter newsletter. There has been a lot going on in the ARG this year with research percolating along and a couple of graduations, or near graduations. We managed to survive a site review on our NSF NanoCEMMS center this Spring and it looks like we'll be doing a fair bit of work in the nano-positioning area for some time to come. There have also been some new initiatives that we've undertaken. More on that later. You can always check the individual student web pages on the website to see what research we're up to. For up to date info on the ARG overall, a good place to start is always the "What's New" section leading off the ARG website at <http://mr-roboto.me.uiuc.edu>.

2. Who's New?

Surprisingly...not many people. At least not so far this year. As you may recall from the summer newsletter last year, we had a large turnover when Brian, Bryan, Mike, Alex,

Ben, Paul, etc. graduated and moved on. (By the way, we still miss Alex's David Hasselhoff trivia.) There were not as many people graduating this year, only a couple. Additionally, those who were receiving degrees decided to stick around the ARG for a bit longer. As a result, there was no real reason to pick up a lot of new ARG students.

The one new face is a visiting scholar. Dr. Xiaohui Xiao, also know as Sophia, is joining us for several months. She received her Ph.D. in 2005 from Huazhong University of Science and Technology in the field of Robotics. She comes to us from the Mechanical Engineering Department at Wuhan University where she runs a research group in the area of robotics. Her robots were typically used to scan power lines for damage. They are pretty cool. You can read more about her on her ARG website



3. Accomplishments

As always, we like to keep you all updated about what we're doing here so that you can still speak with pride about being a part of the ARG family. Here we just give a brief update on some of the more notable things that have occurred to ARG members since the last time we wrote.

- Doug Bristow successfully defended his PhD and deposited his dissertation.

- Kira Barton passed her PhD Prelim examination.
- Doug Bristow was named to the UIUC List of Instructors Ranked as Excellent by Their Students (again).
- Brandon Hincey passed his prelim.
- Brandon Hincey was a finalist for the Student Best Paper award at the ASME IMECE.
- Kira Barton received a Best Presentation in Session recognition at the 2007 ACC in New York City.
- Prof. Alleyne was selected to be a member of this year's class for the Defense Science Study Group (DSSG). This is part of the Defense Science Office. You can find out more at <http://dssg.ida.org/>
- Tom McKinley passed his Qualifying Exam.

If you know any of the people mentioned above, feel free to drop them an e-mail in the lab and say congrats. Also, you can check our ARG homepage regularly to find out whether any new news has come through.

4. Transitions.

Some of our ARG group members have decided to graduate. Interestingly enough, many of them haven't really changed locations at all.

Doug Bristow finished up his Ph.D. and will take up a position at the University of Missouri, Rolla, which is soon to be renamed the Missouri University of Science and Technology. He'll be doing the professor thing at his alma mater. This worked out great because it's right where he and Melissa wanted to be, geographically, for family reasons. However, Doug's decided to stick around for a 1 year post doc appointment in ARG to really get some more momentum before starting at Missouri. Doug will be working partly with the NanoCEMMS and with some other research to really establish his visibility in the precision motion control and ILC communities.

As I write this, Brandon Hincey is furiously working on writing up his PhD dissertation.

After he deposits, Brandon's going to stay on for a while as a post doc in ARG working in the NSF Engineering Research Center for Compact and Efficient Fluid Power. His time is nominally until Summer 2008. He'll still be working on gain scheduling activities but will also work on formulating feedback structures for systems with power regeneration capabilities. The latter task is something related to hybrid vehicles where there's the possibility to both store and extract energy from within the system.

Kira Barton deposited her M.S. thesis last year. However, as mentioned in the last newsletter, she has decided to stay for her PhD. That's good because if she left, our department would need to find a new 'poster child.' Kira is doing a bit of a mini transition though. She'll be spending the Fall semester in the Netherlands at TU Eindhoven. This is part of an NSF program that encourages centers (e.g. NanoCEMMS) to give their students some international exposure. Kira will be working with some folks at TUE that do very similar ILC work to what she does so there was a good match there from a methodological point of view.

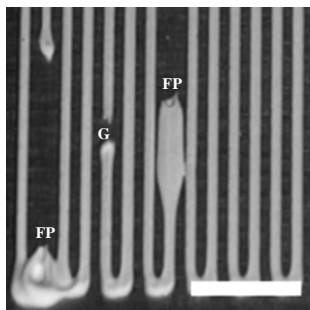
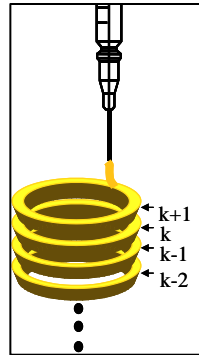
David Hoelzle is also furiously tap, tap, tapping away to get his M.S. thesis under wraps. David has been working with Prof. Amy Wagoner-Johnson and myself on developing manufacturing methods for building bone scaffolds. This September, David will also participate in a 1 semester program where he'll be going abroad to work in another research lab. He'll be going to SIMTech in Singapore. There he'll work on developing technology for advanced fabrication of scaffolds using multiple materials simultaneously. This would include multi-nozzle deposition systems.

Although the transitions of Kira and Dave will be temporary, they will also be very

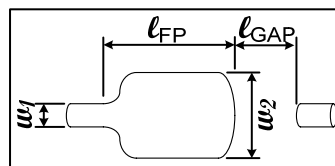
exciting. This is the first time we've had ARG members go to other labs to initiate personnel exchanges. We are hoping this will be the start of something we can continue in the future with new ARG members as they come through. Stay tuned in the future for the outcomes of this 'experiment.' You can also bug them for pictures of their new surroundings. Plus, if you're in Singapore or the Netherlands, maybe you can crash with them.

5. Featured Research.

This newsletter we'll focus on the multidisciplinary activity being carried out by David Hoelzle. David is working on fabrication of bone scaffolds using micro Robotic Deposition. This is a solid freeform fabrication technique that extrudes material through a nozzle and lays it down on a substrate. Parts are created by laying down layer after layer in a predefined pattern. Some of you may have seen related work done before by Doug Bristow for his M.S. and Ph.D. studies.



as few defects as possible?" In order to do this, Dave's done a full factorial Design of Experiments (DoE) study to classify the particular types of defects and build up a process map and determine



what ranges of process inputs affect the relevant defects. The photo shows two different types of defects that could occur in these scaffolds: Filter Pressing (FP) and Gaps (G). The associated schematic shows an idealized classification of the filter pressing defect that allows us to quantify the magnitude of the defect. There are several of these defects. They then have to be weighted as to their overall importance and a quality index assigned, via a cost function, to each fabricated part.

Dave did about 100 scaffolds. He used some neat image processing to automate the defect characterization. Then he did some nifty statistics to determine which process inputs affected which defects. The process inputs were things like speed of deposition, size of nozzle extrusion, etc. This has led to a quantitative evaluation of process maps for colloidal deposition that will be very useful for moving this manufacturing process from the lab bench to industrial practice. Part of Dave's time at SIMTech in Singapore will be to transition this technology. Additionally, upon his return, he'll continue to be working with Prof. Wagoner Johnson's group to build bioscaffolds for actual live animal insertion.

Feel free to contact Dave if you want to know more about this topic.

6. Alumni Focus.

Here's where we catch up with all the wonderful things you folks have been doing to make us look good back here on campus. Our stop this time takes us to sunny and dry England where Evrin Erdem (ARG PhD 2001) is working as a researcher for a hedge fund. The name of the hedge fund is IKOS (www.ikosam.com or www.ikos.co.uk). She is applying a lot of principles from optimal control, dynamic programming, LQ formulation to financial problems. She is quite happy with her current position even

though one may not consider it typical “engineering.” Just goes to show all the different opportunities you can take with a PhD in Controls. From one of the previous ARG newsletters, you can see that Wilbur Langson (ARG M.S. 1997) is also a “quant” working in the financial sector in South Africa. Here’s a picture of Evrin and Ed, her boyfriend of ~3 years, who is still working at Delphi (her previous company) as Powertrain Advanced Technology Manager.



7. Announcements-Catching up.

Starting on the baby trail, there are a few others who’ve made additions to the larger ARG family. Rui Liu (ARG MS 1999) is still in the Bay Area working at Cisco. I heard that he is primarily responsible for their outstanding 2007 2nd quarter performance and stock prices ☺. Seriously though, he and Wei have their hands full with their 2 daughters Sophia and Amy.



life.

Also, Dr. Danian Zheng (ARG PhD 2002) has added to his family. Danian is still working at GE in their R&D facility. Young mister Harry Zheng is sure to add a great deal of excitement to Danian and Ping’s

Continuing with babies, Dr. Rong Zhang (ARG PhD 2002) also has a new addition to his family. His second son YuYang Zhang (“DonDon”) arrived at 4:40pm on June 29, 2007, beating the Apple iPhone by 80 minutes. Apparently, Tin Tin likes being a big brother. That will likely last until DonDon actually starts moving around and taking TinTin’s Toys. Rong is still in the Bay Area entering his 2nd year of his MBA program at Stanford.



Finally, Rajat Shah (ARG MS 2003) and his wife Smita gave birth to a bouncing baby boy on April 10th, 2007. The young man’s name is Sarthak which means “one who has a purpose.” Rajat is still working for Behr in Michigan and getting involved in some more controls related activities. Here we see the two smiling Shah men.

Now, we know there are other baby stories out there from ARG alumni and we’d love to hear from you. I mean, who doesn’t like to see babies? For instance, we have heard that Ben Morgan (ARG MS 2006) had a new family addition but have yet to see evidence. We know there are others.

Babies aren’t the only things being turned out by ARG alumni. Professor Bryan Rasmussen (ARG PhD 2005) is off to a great start at

Texas A & M university. Of course, knowing Bryan, his entry into the ARG newsletter had to involve a family addition. Yes, Bryan welcomed a new member to the Rasmussen clan. As you should come to expect by now, it was a girl: Megan Kathryn Rasmussen. Here we can see Megan with her 3 big sisters, Melissa, Amanda, and Maren. What a picture!



In addition to being **very** productive on the family side (did I mention 4 girls!) Bryan managed to land both an NSF CAREER award for his research and an ASHRAE Young Investigator Awards. Congrats to him for a very productive and successful first year as an ARG alumnus!

Professor Sean Brennan (ARG PhD 2002) received the Penn State Engineering Society (PSES) Outstanding Teaching Award for 2007. It's the top teaching award at Penn State. We always knew he was a great teacher. You can check out his comprehensive new research website at: <http://controlfreaks.mne.psu.edu/index.htm>. There's lots of interesting things going on in Happy Valley.

Paul Kawka (ARG PhD 2006) went through his graduation ceremonies in May 2007.



Here we see a picture of Paul and Prof. Alleyne outside of the Assembly Hall. Paul is working for Procter and Gamble in Cincinnati OH. We got a chance to catch up with him at the ACC in New York and he told all about web handling "at a fraction of the speed of sound." Seems dangerous and cool all at the same time.

While I had the cap and gown for Paul's graduation I just couldn't resist getting a preview of 15-20 years from now. Here's Harmen and Willem Alleyne playing dress up on graduation day.



That's all the news I have right now. Sorry it's been so long that I've been in touch. If you don't hear from me with a newsletter, you can always bug me about it. That way I'll know people are actually reading these ☺ Also, please, please, please send back information about yourselves and what you're doing. It's great for other ARG alumni to just know what each other is up to. It's also great for current ARG members to know what's waiting for them once they complete their time here. I'll look forward to hearing from all of you. Take care and have a great Fall!