



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

ARG Alumni Newsletter Summer '04

1. Greetings

Hello to all ARG Alumni. The new semester has begun and we're a bit tardy getting this ARG update out to you. Part of that is due to some of the "What's new" listed below. There have been some additions to the ARG family and the Alleyne family that have consumed some of the network bandwidth available. Things have been very busy here on the UIUC campus and we're happy to share our changes with you. For further, and more frequent, updates you can always check out the "What's New" section leading off the ARG website at <http://mr-roboto.me.uiuc.edu>.

2. Who's New?

There are several new faces among the ARG family. Interestingly enough, nobody graduated and left the ARG last Spring. This meant that the overall size of our group increased significantly. We see this larger group as a sign of health and vitality in our research activities here on campus. There was a lot going on before they got here and now there's even more research being done.

Kira Barton comes to the ARG from several places. She received her B.S. degree from the University of Colorado but then did two very different jobs before settling on UIUC for



graduate school. She first worked in the wilds of Alaska for British Petroleum and then went to work for Woods Hole Oceanographic Institute in Cape Cod, Massachusetts. Her project will be in the nanomanufacturing area related to the new UIUC NSF Engineering Research Center: NanoCEMMS.

Brian Eldredge comes to us from Brigham Young University in Utah. Brian will be working on improved modeling techniques for our thermal systems analysis tool Thermosys. He'll be finding better ways to incorporate empirical data into our current code as well as expanding the functionality and types of components available. Interestingly enough, Brian works in the same area as Bryan Rasmussen which means there are now two Bryan/Brian's, both from Utah, both married, and both working on vapor compression cycle control.



Alex Montgomery is a new student to ARG but is actually a UIUC undergraduate student. He is currently part of our combined BS/MS program. He will be working on the general area associated with the EVPS to do optimally efficient power generation and distribution. Unfortunately, at the time this newsletter went to press, Alex's picture wasn't available. Please check his website to get a sense of who he is.

Ben Morgan comes to us from the University of Kentucky. He is working on

dimensional analysis of control systems. His focus for his first semester is to determine whether or not some of the benefits we have uncovered in the vehicle technology area apply to other types of technologies. In the picture shown here, Ben is not demonstrating the effects of social anxiety disorder causing him to cover his head and face. Rather, he's shown in some of the flight gear he wore while doing some zero-gravity in-flight experiments while an undergraduate. This was part of a NASA sponsored program.



Mike Keir, come from cheesehead country, also known as Wisconsin. At the University of Wisconsin, Mike received dual degrees in Mechanical Engineering and Math. When he's not training for triathalons, Mike is working on the Vapor Compression Cycle project as well. He represents ARG's first foray into the field of fault detection. He'll be learning how to use dynamic fault detection to identify faults as they are occurring in air conditioning and refrigeration systems. The initial goal is to detect faults before they cause major problems. Hopefully, after the fault is identified, alternate control strategies can be used for fail-silent or fault-tolerant behavior.

We welcome these new faces into the ARG and look forward to watching them develop into first-class controls researchers. The ARG alumni have set a high bar of achievement but we're confident that these folks can keep things going here.



3. Accomplishments

Speaking of accomplishments, it's important to let you all know how things are going back here at UIUC. This way you know that those you left behind are carrying on the ARG tradition in fine form. There have been several notable accomplishments by current ARG members and we'd like to share those with you.

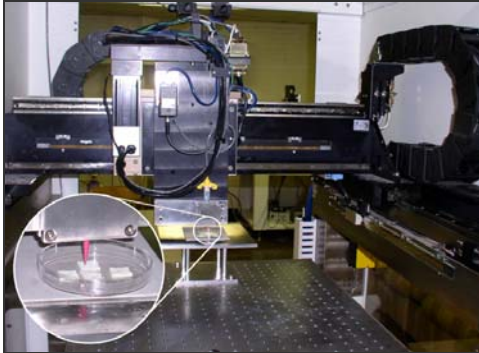
- Brandon Hency passed his Qualifying Examination this August. This means he's here for the long (& hopefully enjoyable Fall)
- Bryan Rasmussen passed his Preliminary Examination. Just one more hurdle before we start calling him Dr. Bryan. A wee little thing called a dissertation.
- Bryan Rasmussen also began teaching a class (ME 360) as a full time instructor as part of his ASME Graduate Teaching Fellowship.
- Professor Alleyne was promoted to Full Professor over the summer. Now that he's a Full Professor with an endowed chair there's really not much left to shoot for. He'll probably retire in place for the next 30 years...yeah, right.
- A new ARG member, Ben Morgan, was awarded a National Science Foundation Graduate Student Fellowship prior to his joining the ARG.
- A new ARG member, Michael Keir, received an M&IE departmental fellowship prior to his joining the ARG.

If you know any of the awardees 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.

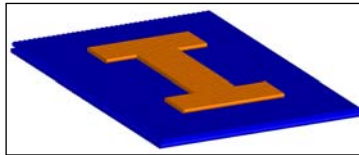
4. Featured Research.

Some of you liked the research focus last time so we're keeping it. One of the interesting things that's developed over this spring and summer is the research work being performed by Doug Bristow. Doug has been working in the area of Micro-Robotic Deposition (μ -RD). Here, a non-newtonian colloidal slurry is extruded through a narrow opening (100-600 micrometers diameter) and

directly deposited onto a substrate. The idea is that we can directly ‘write’ three dimensional structures by building up several layers of deposition.



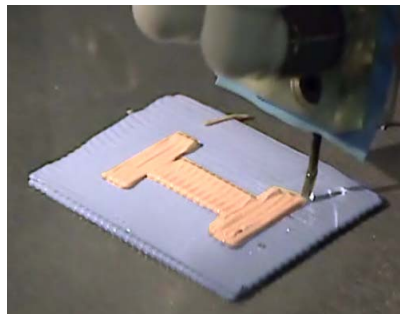
The machine Doug is using to do this is a gantry-type robot driven by linear motors. This is shown in the picture above. We move the robot around and coordinate that motion with pressure driven flow of the colloidal slurry to lay down patterns such as the block



“T” shown here. This pattern can be drawn in a solid modeler and then

quickly transferred to an actual part such as the one shown here in the post-manufacture photograph.

One of the keys to this two material part (how else would we get orange and blue?) is a



novel two material valve that was developed by another graduate student working with Doug on his NSF sponsored project.

In addition, Doug and Marina Tharayil have come up with some very novel advanced in precision motion control. By using time-frequency analysis they are able to develop really interesting time varying filter schemes similar to adaptive signal processing. These schemes can be used in their Iterative Learning Control algorithms to improve upon

the performance/robustness tradeoff common to most control systems.

5. Alumni Focus.

Every newsletter we experiment a bit with something new. Here we thought it would be neat to catch up with one of our alumni and see how they’re doing in the ‘real world.’ The alumnus featured this time around is actually the first graduate of the ARG.

Mark Depoorter received his BS degree in General Engineering from UIUC in 1995 and his MS degree in Mechanical Engineering in 1997. He was our first Alumnus and did all of the initial work on the Illinois Roadway Simulator design, construction, and testing. He graduated and went to work for John Deere in Moline, Illinois. Here he started out in the area of vehicle testing where they would try to do accelerated life cycle testing of various machines and components. It’s called Accelerated Design Verification (ADV) Here is a picture of one of their STS combine ADV vehicles ready for vehicle testing.



Since then, Mark moved from testing to design and he is currently a Senior Engineer at Deere, meaning he coordinates all the design work that goes on in his group. Mark’s work has allowed him to travel all over the world, from Germany to Brazil. His latest project is an upgrade of an already popular Deere STS combine model. He’s working on improving the loading to be up to 50% faster.



According to Mark:

“Even though I am not directly using my controls and dynamics background from my graduate work in my everyday job, I am using the skill sets that I used during my graduate work. DOE and proper test procedures, frequency analysis, filtering of data, sensors and data acquisition equipment, mechanics, and dynamics are all skills I use every week on the job. It is amazing how far good sound engineering principles will get you! The biggest thing I have learned in my job is that you have to be willing to take risks and be willing to learn new things, no matter what age you are.”

Mark lives in East Moline with his wife of 5 years, Stacey and their nearly 3 year old daughter, Kayla. As we can see, the Depoorter’s are making sure that Kayla will be leaning towards the University of Illinois when her college days come. Check out that orange and blue; Go Illini!!



6. Announcements-Catching up.

With the number of ARG alumni growing by the year, this section is getting longer and longer each time. Many of you have been up to neat things and it’s really great to hear from you. Please keep the updates coming in.

Dr. Yisheng Zhang went through his graduation ceremonies last May. Here’s a

picture of Yisheng and Prof. Alleyne in front of the Assembly Hall. Yisheng is now in a technical management program at Eaton in Michigan.



Now we get to the part about babies and weddings!



This spring saw a couple more family additions to the ARG brood. Byran and Holly Rasmussen had another daughter, Maren. That now makes 3 daughters in a row. Any takers on what the next one’s going to be? Here we see Bryan during one of his more awake moments.

The Alleyne family also saw another boy come into the fold. Willem was born in March of 2004. The Alleyne’s were doing their best to balance out the Rasmussen’s girls with their boys but once daughter #3 came, they decided to concede superiority to Bryan and Holly. They win. Here we see Willem with big brother Harmen just kicking back.



As for the weddings, Nick Ploply (ARG 2003) married Anjali Rangaswami. Here we have a rather risqué picture of the newlyweds.



Two other weddings occurred since our last writing. Rajat Shah (ARG 2003) married Smita (see last newsletter) in Jaipur, India. Not many ARG members made the trip all the way to India for the wedding. Rajat is doing well now and working for Behr in Germany. We hope to have him back stateside soon. Also, Matt Polley (ARG 2003) married his college sweetheart Becky over the summer. If you two have pictures, please send them over and we'll see about getting in the next newsletter.

Other alumni we've heard from include Eko Prasetyawan. Eko is doing quite well at Caterpillar in their Technical Services

Division. Here's a picture of Eko, Fifi, and their two kids.



That's all the updating that we have for you this time. Also, you probably feel you've spent enough time reading this. As always, we look forward to receiving news and notes about the things you're doing. Take care and we plan to touch base with you again in about another half a year.