Professor Eric Pop

Interview By Austin Kim (EE '09)

HKN welcomes Prof. Pop as our new faculty adviser starting in the Spring 2009 semester. Prof. Pop teaches ECE 440 and an offering of ECE 598 (Hot Chips: Atoms to Heat Sinks). But did you know that he is also a DJ? In this interview, Prof. Pop talks about his background, research, interests, and gives advice to students.

Tell us a little bit about your upbringing, where you grew up, and anything else relevant.

I am originally from Romania, and I moved to the US when I was 17 years old.

To put this in historical context was this before or after the Berlin Wall fell?

This was a few years after the Berlin Wall fell. About the time that all of us started listening to Nirvana.

How is your Romanian tongue? Are you still fluent in it?

I would say that my Romanian is good. I cannot give a technical talk or lecture in Romanian, since I learned all the scientific terms in English. But I can hold conversations with the other Romanian faculty such as Professor Popescu and Gross here in our ECE department. My Hungarian is on the other hand awful.

Ah so you grew up in the part of Romania with a lot of Hungarians, in Transylvania?

Yes, I grew up bilingual speaking Hungarian and Romanian. My grandmother was Hungarian, but I learned most of it from watching TV, and because half the kids at the playground spoke Hungarian.

So, how did you become interested in electrical engineering?

Well, I wanted to become an astrophysicist and wanted to study stars. I became interested in it because I read a lot of sci-fi books, from Jules Verne to A.C. Doyle. So, I entered MIT as an undergrad in physics, but after taking a few EE classes, I became more interested in solid-state physics. There are many open-ended questions still remaining in this area, and the applications of solid-state are also much more relevant and immediate (transistors, lasers, carbon nanotubes). A lot of the MIT undergrad curriculum is shared between EE and CS, but it turned out I liked EE better than CS too. Eventually, I still finished my major in physics, but double-majored with EE.

How did you come to the ECE department here at U of I?

Well, I then did my Ph.D. in Electrical Engineering at Stanford, followed by a post-doctorate studying the electronic and thermal aspects of single carbon molecules, working with a chemist. I also worked at Intel for a year and a half, having spent a total of seven years in the Bay Area.

I got contacted by U of I for an interview. Faculty positions in top departments are very difficult to get (universities typically hire only enough to replenish their faculty, about 1-2 people per year in a given area), so naturally it was great to get this job. It’s been a great fit for my interests, which lie more along teaching and basic research, rather than applied product-driven development.

What specific fields in electrical engineering are you interested?

I study nanoscale energy transport, more specifically power dissipation in nanoscale circuits and semiconductor devices. From a materials perspective, we are focusing on carbon nanotubes and graphene, which have electrical and thermal properties superior to silicon. Some of the work we are now doing is similar to early groundbreaking work done with silicon 40 or 50 years ago. So, there is a lot of excitement in the field, and many unknowns which we hope to contribute towards. (continued on next page)

So do you have any hobbies or any interests?

At the moment, I don’t have that many hobbies due to work, but my interests are music, soccer, and snowboarding, probably in that order. During graduate school, I used to be a DJ for four years at the Stanford Radio station, KZSU 90.1 FM. I also DJ-ed at various Stanford parties and San Francisco clubs, which was a great way to earn some money on the side, and meet people who were not necessarily in electrical engineering.

What’s interesting is that preparing for a radio show is similar to classroom teaching. I had to be ahead of my playlist and the musical trends at the time, just like when teaching I need to be ahead while preparing my lectures for ECE 440.

So could you expound on what genres of music you are interested?

I am interested in House, Techno, Drum and Bass; to be more specific, Deep-house, Tech-house, Micro-house. Also, 80’s “golden age” hip-hop… I’m not a big fan of gangster rap.

What were the most recent concerts you’ve attended?

The last concert I attended was Atmosphere at the Canopy Club, which is an underground hip-hop act from Minnesota. Before that, I was glad to catch Hot Chip up in Chicago.

Where do you go to attend concerts normally?

I find the stuff they play at Assembly Hall too main-stream and tend to avoid those. I frequently attend Canopy Club for its good, live music. Canopy Club was a good find for me, and helped me adjust to Champaign-Urbana after moving here from San Francisco.
How interested are you in soccer?

I am quite interested in soccer. I’d wake up at any odd morning hour for the World Cup soccer games in Korea (2002) or Germany (2006). Luckily, there’s TiVo now, so I don’t have to do that as often. I also will go out of my way to watch the UEFA Cup, but not so much with normal club games. Of course, I am still a fan of the Romanian national football team.

What is your favorite quote?

My favorite quote is from Dr. Strangelove, and it is: “Gentlemen, you cannot fight in here. This is the war room!” I love the absurdity of that particular situation, and in general how well the movie relates to some of our present-day conflicts.

Ah, are you interested in old movies?

Not particularly. I am not really a movie buff, although I did take an acting class at MIT, but ended up with a B.

Do you have a Facebook account?

Yes, I do. Every young professor who was a grad student in 2004, when Facebook first came out, probably has one. Some have probably joined since then. As for the students out there on Facebook, unlike the average employer, I personally do not care if you have pictures doing silly things. If you work with me or take my class, I only care if you can do good work.

What is your research area?

My research area is in nanoscale energy transport, specifically power dissipation. I research carbon nanotubes, phase-change materials, and graphene. Do you have any possible undergraduate research ideas? Currently, there are four undergraduates in my lab. More specifically, some of them are doing Matlab simulations on carbon nanotube mobility, and taking measurements to help graduate students. We are generally interested in undergraduates who want to get some hands-on experience setting up lab equipment, or those who enjoy Matlab or C programming to solve interesting problems related to our research (e.g. transistors, or nanoscale energy dissipation).

What courses should students have enjoyed to talk to you about research?

I would say, Physics 213/214, and ECE 329, 440, and 444, although not all are prerequisites. This is just the general undergraduate area that we operate in.

How many students are currently working under you?

There are currently 5 grad students and 4 undergrad students in my group.

For credit which courses will you sign off?

I allow ECE 396 (Honors Project), 497 (Senior Research), and 499 (Senior Thesis).

What qualities should a student have in order to work with you?

Two qualities are probably most important: “smart” and “can get things done.” Beyond that, we can teach them most of the details, although some of the classes mentioned above are nice to have. Depending on the project, preferably some programming knowledge and hands-on skills are useful. For example, C/Matlab/Java programming, or the types of people who can take their car or bike apart and put it back together. We have had freshmen working in our group as well, so students do not have to consider 440 as a “prerequisite” for us at all. But it is nice if they come to talk to me with some previous knowledge and curiosity about our area of research... three words of advice: check our website!

What are the weekly requirements for undergraduates in your lab?

Undergrads typically work 5-10 Hrs/week average, but it depends on their class load, or any deadlines that may be approaching. Almost any workload can be accommodated as long as there is good communication between the undergrad, myself, and the graduate student involved in the project.

How many semesters would you expect a project under you to take for completion?

At least two semesters, or a semester plus summer.

What are your immediate and long term goals, both outside and inside the classroom?

Inside the classroom, I would like to create more student excitement toward ECE 440. I think this course has gotten a poor reputation in the recent past, much of it undeserved. This topic is a true gateway to the Nanotechnology area of our Department, with historical roots tracing back to John Bardeen. Thus, both its history as well as its future are extremely important. I am now working with several students to bring a small hands-on component to 440, which should give future generations a better sense of the excitement created by measuring (and understanding) how nanoscale electronics, like carbon nanotube transistors, work. Outside the classroom, my plan is to evolve my lab and research group into the world leader in nanoscale energy transport, and low-power nanoelectronics. I would like to see my research students, both graduate and undergraduate receive the best training, and take key leadership roles in shaping the future of this area.