

From Trash-Picking to Startup

3/9/2013

G. L. Charvat

Regional Leadership Development Conference, Society of Hispanic
Professional Engineers

Outline



- Early background
- The undergraduate experience
- Research assistantship, MSEE-PhD
- Make a Website
- MIT Lincoln Laboratory
- Co-founder Butterfly Network Inc.

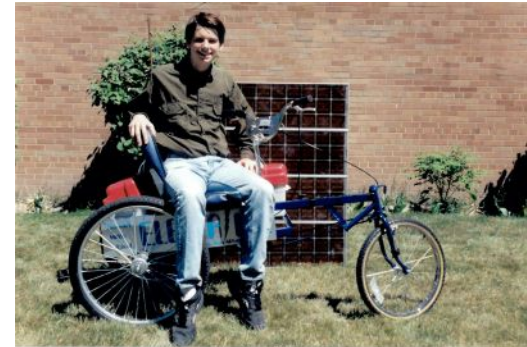
Build things soon as you can.

- Did not like school, wanted to make things.
- Mother was earning BSEE at Lawrence Tech.
- Curious as to how television worked.
- Trash-picked broken TVs, radios, to take apart.
- Neighborhood CB radio network.
- Licensed amateur radio operator age 13.



Learn to take on larger/longer time-frame projects and finish them:

- Motivated by school shop teacher, joined team to build solar car.
- Joined radio astronomy team in high school, built 1.425 GHz radiometer.
 - Won 2nd Place for Engineering in ISEF '97



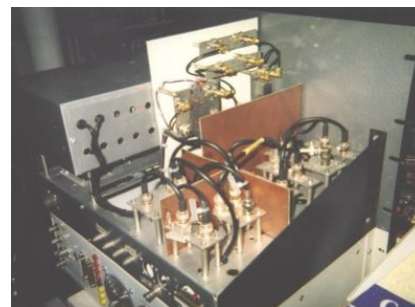
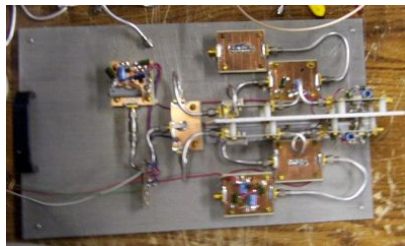
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Apply theory to practice soon as possible.

- Michigan State University
- Did not pay attention in class.
 - Would draw schematics of radios, radar equipment, and vacuum tube audio gear in page margins.
- Developed FMCW radar equipment, UWB impulse radar, and an all-vacuum tube home theater system (made front page of AEX magazine two months in a row)



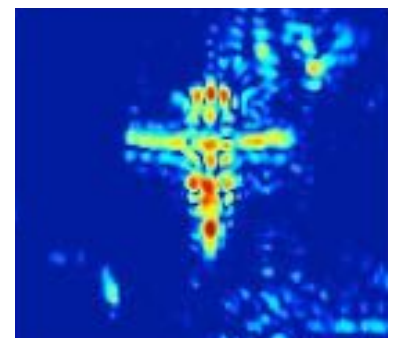
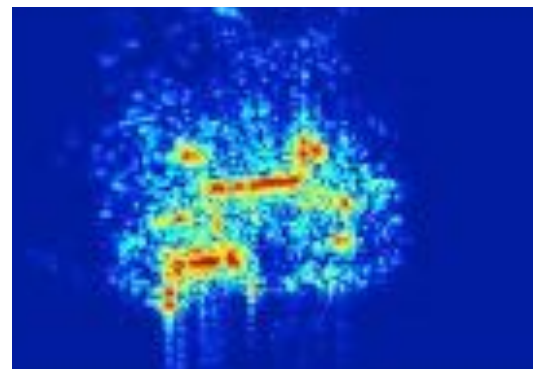
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Now you have time to focus and learn specific talents.

- Joined MSU's applied EM group.
- Took interest in radar imaging, was given freedom to pursue.
- Developed five radar imaging systems.
- Realized value of web
 - The 'gun' of the 21st century, an equalizer.
 - Competing with top candidates, was offered staff position at MIT Lincoln Laboratory.



When given an opportunity to lead yourself take it.

- For dissertation:
 - 3 radar imaging systems
 - Near-field S-band through-wall imaging array
 - Brought idea with me to MIT/LL



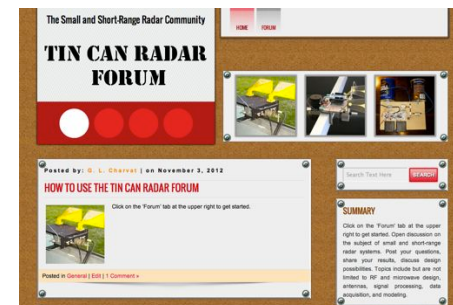
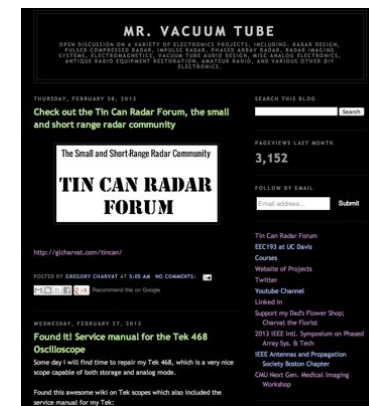
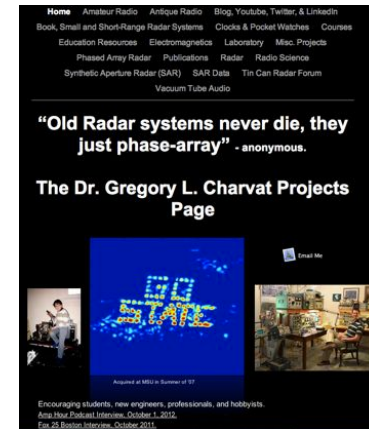
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Make a Web Page!

- Document everything.
- Share w/community, you are doing everyone a service.
- Show what you can do, facilitate career movement.
 - Easier to get position you want because everyone already knows what you are capable of.
- Ultimate equalizer, the gun of the 21st century.
- Web page facilitated every career move since grad school.



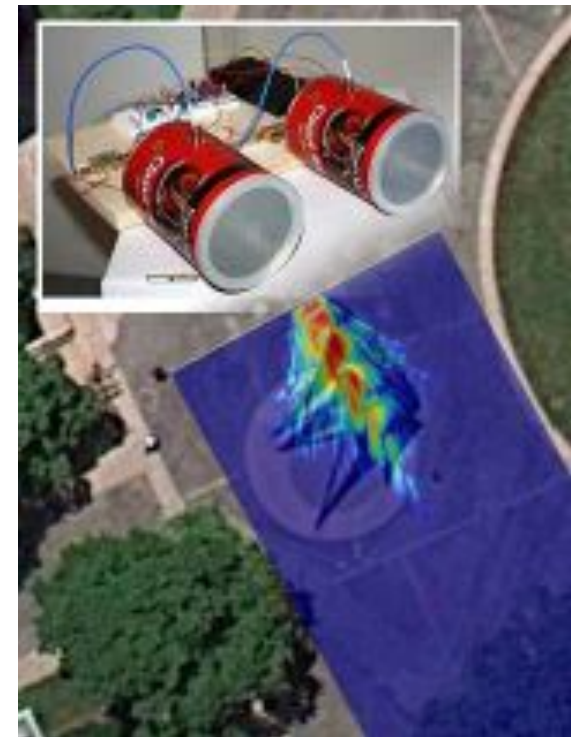
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Work for MIT Lincoln Laboratory, get your name out there

- Technical Staff
- Significant responsibility.
- Worked on large government programs.
- Managed projects.
- Brought in dissertation project, developed into high performance thru-wall imaging system.
 - Best resolution and sensitivity through-wall radar system for stand-off ranges.
 - Front page of MIT.edu, Fox 25 TV interview, BBC radio interview, numerous magazines, papers, blogs, etc.
- Created the MIT Build Your own Radar System Course.
 - Top-ranked MIT Professional Ed. Course '11
 - IEEE Spectrum Magazine Nov. '12
 - Widespread adaptation in numerous universities.
 - MIT/LL has since developed two spin-off courses.



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- Co-Founder and Hardware Team Lead
- Sponsored the Next Generation Medical Imaging Workshop at Carnegie Mellon University
- Scientific advisory board include Profs
 - Ron Walsworth, Harvard
 - Max Tegmark, MIT
 - Pierre Kuri-Yakub, Stanford
 - Charles G. Sodini, MIT
 - Robert McGough, MSU



Summary

- Build something as often as possible.
- Freedom in grad school!
- Make a website to position yourself for opportunity.
- Responsibility when working with an FFRDC like MIT Lincoln Laboratory.
- Join a startup and drive yourself harder than ever.

PS. Seeking help: CMOS Fab Processing and 3D visualization, please e-mail charvatg@gmail.com