First, thank you for taking the time to find out about Princeton University’s entry into the 2005 DARPA Grand Challenge $2 million autonomous vehicle competition.

What is the “Grand Challenge?”

The Grand Challenge is a competition being sponsored by the U.S. Government through DARPA, the Defense Advanced Research Projects Agency. They are offering a cash prize of $2 million to the first team to build an entirely autonomous vehicle that can traverse a 150 mile off-road course somewhere in the desert between Los Angeles and Las Vegas.

The caveat is that the actual course route is kept secret until two hours before the race is due to start, meaning that a vehicle must be prepared to navigate totally unknown terrain strictly on the basis of its onboard sensors.

Wait...“autonomous?”

Correct. Once released, the car will have to drive itself over an unknown off-road course for over a hundred miles. Teams aren’t allowed any control whatsoever over their vehicle after the race starts, so its up to the design itself to complete the course, navigating turns, staying on the road, and avoiding natural hazards and deliberately-placed obstacles.

Has this ever been tried before?

Yes, this competition was first run last October, with 25 entries from a variety of institutions selected from a field of 106 to attempt a 142 mile course that ran from Barstow, California to scenic Primm, Nevada.

The best finisher, developed by Carnegie Mellon U. was a stripped Hummer outfitted with all sorts of sensors, not to mention a complete 50,000 square mile digital topographic map of the SE California/Nevada area. Their school spent an incredible $3 million on the design.

As for results, they made it an impressive 7.4 miles before they got stuck going around a turn and the onboard computer increased throttle until they incinerated their tires and broke their rear axle.

The second runner-up made it 6 miles before their GPS cut out and they tried to drive through a mountain.
Needless to say last year's results were very disappointing. DARPA agrees, and has since doubled the cash prize from last year's $1 million to entice more entries. In addition, the rules have been modified in an attempt to discourage the kind of "brute-force" tactic tried last year by the "top" team. The focus this year is on autonomous control and sensor fusion, not toting Mapquest in your trunk.

As the team from Princeton University, we are looking to design a serious contender for the win, but in order to do so we are going to need the best innovating minds in the country, the absolute state of the art in technology and enough moxie to bring all the systems together so on race day there is not a stone or sand dune in the Mojave that our car couldn't think its way over.

However because our student research projects are pushing the known horizon in a variety of disciplines, we are going to need a lot of help to turn our dreams, designs, and lust for victory into a functioning system.

That's where we hope you'll consider joining us.

Why should I get involved?

We have sent inquiries because we would like your help in making the most of this historic opportunity. This project promises to be a tremendous technical and design challenge, certain to bring out the very best in the nation's engineering students, faculty, and hobbyists.

We think that you'll find a partnership with our team very rewarding, not only in terms of company name exposure here at the university, which couldn't but be helpful for recruiting purposes come spring, but also participating in an exciting, competitive endeavor that will fire the imagination of your organization. Partnership in this project has already proven immensely rewarding for a variety of well-known companies.

Corporate sponsors of individual teams last year included:

- Boeing
- Intel
- Northrop Grumman
- Honda
- Google
- Caterpillar
- Polaris
- Analog Devices
- BF Goodrich
- ATI
- HELLA
- Goodyear
- National Instruments
- Rockwell Scientific
Why is Princeton the team to support?

Though some of the other teams in the field have the advantage of significant capital investment from their institutions, we believe this brings the kind of complacency that led to last year's disappointing finish. Because we are not content (or able!) to simply spend someone else's money, we're forced to tackle these significant engineering challenges with a much more steadied and theoretically sound approach.

Our focus is on elegant, innovative answers to the engineering questions posed—research that is both relevant to this race, and more importantly academically sound.

What benefits can I expect?

If you decide to help our team, we can promise you generous media coverage for your brand in our locality, the Tri-State/NY Metropolitan area, with your choice of company logo featured prominently on the vehicle itself, as well as in any team literature including press releases and scholarly journal submissions. Last year's event captivated the imaginations of audiences across the country, and there's certainly no reason to think interest will be at all diminished this time around, especially in light of the huge prize and what is sure to be a more competitive field.

How do I know you guys are serious about this?

We already have a vehicle, which was donated to us free of charge by a major (two-letter) American car maker. We also have the unparalleled resource of world-class faculty advisors, led by Professor Alain Kornhauser (Operations Research), and including others that represent the full academic repertoire of our School of Engineering and Applied Science. Also, our central location gives us the advantage of total access to advisors and resources in industry and at neighboring institutions throughout the Northeast and across the country.

What research areas are you guys looking at?

Currently, our team has identified the following core areas for research focus, and has placed a senior (not to mention his/her thesis grade) responsible for each:

- Management and Logistics
- Vehicle control and optimization
- Decision making, route generation and sensor arbitration
- Passive sensor design, machine vision and image processing
- Active sensor design (laser, RF, and low-level processing and obstacle detection)

How can I help?

The most important thing we could ask of a potential sponsor is their support in the form of merchandise, either donated to us or placed at our disposal on long-term loan. Your specific products and expertise are of significant value to our project and will enable us to not only further autonomous vehicle research as a field, but also bring home the trophy come race day next fall.

For more information, contact me any time by email, post, phone or FAX:

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We look forward to working with you on this historic project!