Mentor Graphics,

As the Oregon State University Mars Rover Team Captain, I am writing this letter to request sponsorship from Mentor Graphics in the amount of $5000. This funding will be put towards the costs related to developing our Mars Rover for this year’s University Rover Challenge (URC). I'd like to discuss our status as of last years competition, our plan forward for the 2012 competition, and what we can do to make your generosity worthwhile.

The URC is an international robotics competition held annually by the Mars Society. The URC is held at the Mars Desert Research Station (MDRS) in Hanksville Utah. The premise of the competition is to simulate the tasks that Remote Operated Vehicles (ROV) would need to tackle on a typical martian day, assisting astronauts that have already established a small research station. On average, 10 teams participate. This will be our 5th year as competitors and we hope to continue to make as much of an impact as we have in the past.

Here’s how we’ve placed in the URC in the previous competitions.

* 1st Place - 2008
* 4th Place - 2009
* 1st Place - 2010
* 3rd Place - 2011

After definitively winning the competition in 2010, the rest of the teams improved and put much more effort into the design and fabrication of their robots for 2011. Despite our improvement in performance between the two competitions, they were able to surpass us. With simple designs that solved problems more elegantly than ours.

Despite the enormous effort put into our 2011 design, there were flaws that took their toll during the competition. Our video transmission system was put together from commercial products that turned out to be better suited for use in a home surveillance system and our motor control system had issues with reliability.

On the bright side, we were able to improve upon many aspects of the 2010 design and, overall, created a fairly advanced robot. We designed and fabricated nearly all of the electrical, mechanical, and software systems from scratch. We used PADS to design all of our PCBs.

* Main controller
  + 2X microcontrollers
  + GPS receiver
  + 3 axis accelerometer
* Servo controller
  + Microcontroller
  + 3X differential serial transceivers
* 10A DC motor controllers (8 used on the rover)
  + ATMEL microcontroller
  + Our own H-Bridge and control loop design
* Camera controller
  + Microcontroller
  + High sensitivity barometer
  + 3 axis accelerometer
  + Microphone and audio amplifier
* Arm controller
  + Microcontroller
  + Differential serial transceiver
* 2.4GHz 30dBm RF transmit receive module (never completed)
  + Co-planar waveguide
  + RF amplifier IC

This year, we plan on improving the 2011 Rover design by improving our reliability issues, further reducing weight, and by simplifying it’s components. We will also focus upon our user interface to make operating the Rover more intuitive than in previous years. The video system is being re-designed to be application specific and should provide the performance that it was lacking in 2011. The chassis is being modified to provide greater versatility of motion, allowing the rover to travel in any direction from any orientation. We will be designing PCBs with PADS again as well.

We could not make the Mars Rover happen without your contributions. To hold up our end of the deal, we will make sure to take the following actions.

* Mentor Graphics logos on the Mars Rover
* “Designed with Mentor Graphics PADS” logos on all PCBs
* A Mentor Graphics logo and link on our team website
* A large logo on our 12’X3’ sponsors banner
  + This banner will be displayed at the events we attend
    - Evergreen Air and Space Museum Robotics Expo
    - Google Robotics Expo
    - Design Presentation at NASA JPL
    - City Square Beaver Days
    - OMSI Space Gala
    - OSU Engineering Expo
    - OSU Foundation Student Showcase
    - Any time we perform testing in public
    - Engineering events on campus
    - The URC

It is my hope that Mentor Graphics will find that providing a $5000 sponsorship is feasible. Your continuing support will provide us with an opportunity to continue making successful designs and to push the boundaries of aerospace technology.

We would love to visit Mentor Graphics in Wilsonville. Let us know when to stop by!

Sincerely,

John Zeller

Undergraduate Student – Computer Science

Team Lead – 2012 Oregon State University Mars Rover

(503) 896-4679