

December 2013



UNIVERSITY OF MICHIGAN
SUPERMILEAGE

Editor: Agney Deshpande

Subteam Updates: Race Strategy

Happy Holidays!

Check out UM Supermileage featured on Canada's CTV News Network

["University Students creating fuel-efficient vehicle"](#)

Race Strategy has been working on creating more accurate optimization models and moving closer to vehicle testing. The main goals of RS are to optimize every part of the vehicle, make sure all the aspects of the car work together, and understand our energy system. The team is preparing for our first test in the Michigan Engineering wind tunnel. We will use a 1/4th model of our new body design constructed from tooling board to help quantify our aerodynamic drag. Even though we plan to average only 15 mph during competition, we will have the opportunity to test our

model up to 120 mph in the tunnel.

Race Strategy has also made significant changes in our Data Acquisition system. This system collects altitude and position data around the track, and will calculate the optimal speed at each position. This year, we are working to integrate our real-time data onto a smart phone, which will allow us to make better mid-race decisions. In addition, the new mobile device will have greater connectivity and a much more intuitive interface than the previous Arduino system. However, the move to a smartphone

requires us to develop a network communication between the phone and base computer in order to have the required computing power.

Race Strategy's third focus is rolling resistance testing. The cold weather has stalled our plans, but just like many people do, we are trying to continue to exercise our vehicle on a new indoor treadmill. In addition to protecting our vehicle (and members) from the elements, a treadmill test has no wind contamination, providing us with more accurate results.

Sponsor Highlight: College of Engineering



MichiganEngineering

The University of Michigan's College of Engineering is continuously ranked as one of the top ten engineering schools in the nation and one of the top fifteen in the world. Founded in 1854, the College was the first public university in the country to grant an engineering degree. As of today, there are over 7,000 enrolled

students from undergraduates to grad students, as well as 60,000 living alumni. The College of Engineering offers many multidisciplinary opportunities to its students. Students have access to the Wilson Student Team Project Center as well as over 100 labs and opportunities to assist with their projects and research. The Wilson

Center allows students 24/7 access to a machine shop, vehicles, workspace, a design room, and more. The Wilson Center also offers training in basic machine work as well as specific methods such as mill and lathe. Supermileage appreciates all the University does to support us.

Go Blue!

Modular Design

What is modular design? Professor Bell, our multidisciplinary mentor, has called it a “plug and play” system, and the idea of modular design is instead of creating one piece, or in this case building a single



vehicle, we build many pieces of the vehicle individually and once they're complete, assemble the finished single vehicle in its entirety. Instead of permanently fixing every element into the vehicle, each part is attached by a mounting point previously set into the carbon of the body. This allows more time for testing and optimizing specific aspects individually.

In the past, if we needed to redesign a specific function of the vehicle that had already been completed, we would have to remove it from the body before doing so. Not only does this technique risk damaging the body, but it is time consuming and forces everyone to work in a very cramped space. The rules of our competitions state that significant changes must be

made annually to the vehicle. Modular design allows us to adhere to this rule by simply replacing last year's mounted parts with this year's redesigned ones. As DII lead John Young states, “With this ability to only change one system from year to year we have much more time to optimize our designs, leading to a higher quality and more competitive vehicle”.



What are your plans for the New Year?

Research new testing methods

Create local restaurant sponsors

Start Tech Talks at GBMs to increase member understanding

Produce team documentation so we don't forget our past mistakes or solutions

Get more sleep!

Create a Systems engineering position to foster intra-team communication

Set up a Work Day carpool to get members from Central Campus to North

Revamp the website to be easier to navigate



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