



Tomorrow's Engineers

Hybrid Bicycle:
dSPACE Supports Young Researchers

A hybrid bicycle that stores braking energy and then releases it to support acceleration: This exciting new idea took three young researchers from a Paderborn school, and their physics teacher, to first place at the regional Young Scientists Competition. dSPACE provided the funds for acquiring important components and tools for this project and also helped out with advice to the young engineers. This sponsorship was part of dSPACE's ProMINT initiative (mathematics, informatics, natural science, technology), which aims to motivate school students to study scientific and technical subjects at university level.



The young scientists Wolfgang Fritz, Georg Enzian, and Stefan Beller (left to right) from the Theodorianum School in Paderborn together with the hybrid bicycle.



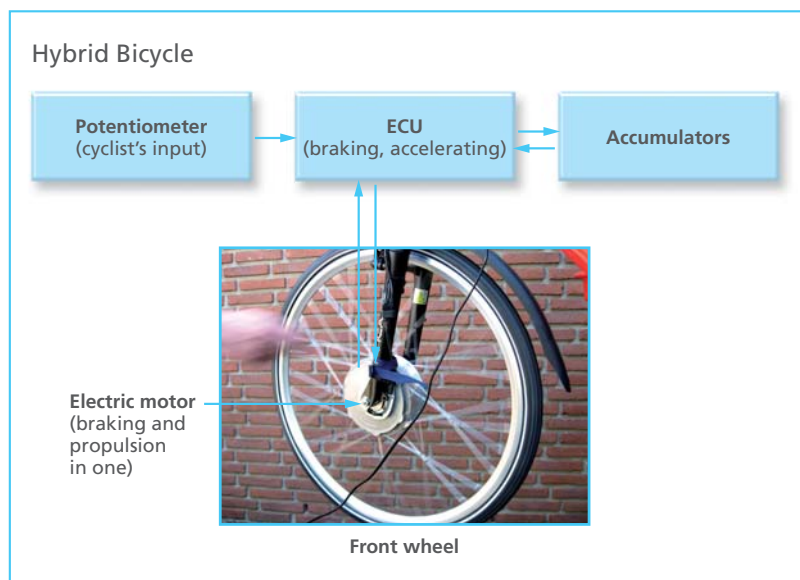


Hybrid Bicycle: Power to Start

Cycling is healthy and environmentally friendly. But repeated stop-and-go – braking and then starting or accelerating again – can put quite a strain on the muscles. Long journeys can be very tiring, and often enough, people resort to their cars for this very reason, even though they would really like to do more cycling. But what if the energy that gets lost in braking could be harnessed for starting off again? It can be done – as three students from the graduating class at the Theodorinum School in Paderborn notably demonstrated, with the help of their physics teacher and advice from dSPACE engineers. The result is impressive: a hybrid bicycle with an energy recovery system that captures most of the energy used in braking and releases it via an electric motor when the cyclist pushes off again or accelerates. The electric motor, which is installed in the front wheel hub, is actually a brake and a propulsion unit in one. Batteries are used to store the energy. A simple electronic control unit regulates the

flow of energy, and the cyclist uses a potentiometer to brake and accelerate. Programming the micro-controller was a particular challenge, and the students mastered it brilliantly. No wonder the innovative hybrid bicycle took the Paderborn students straight up to a well-earned first place in the Young Scientists Competition at regional level,

winning second prize at state level and also a special award. Congratulations! ■



A hybrid bicycle that stores braking energy and releases it for accelerating – this innovative prototype won the first prize in the Young Scientists Competition for three Paderborn students. dSPACE supported the young researchers financially so they could buy components and tools, and gave them technical tips on implementing their idea.

Interview

Dr. Herbert Schütte,
Director of Applications &
Engineering (dSPACE)



Dr. Schütte, what was it like providing consultation services for a student project, instead of for a major automotive customer?

I was really impressed by the dedication and technical creativity of the students. These are precisely the qualities that tomorrow's engineers need. Never give up and be prepared to try unusual solutions – even in industry, that's the only way we can develop the technology of the future. My engineering colleagues and I had great fun working with the students, particularly since they had a surprisingly high level of knowledge of software and hardware. I hope I'll have enough time outside my core activity as head of customer applications and engineering at dSPACE to continue advising on ProMINT projects.

In what way do you think dSPACE can stimulate young people's interest in technology and science?

Well, to develop an interest for any subject – and this doesn't only apply to technology, of course – you first have to come into contact with it somewhere, somehow. Most young people handle electronic systems on a daily basis: cell phones, cars, cameras, etc. But sadly, the majority have no idea how they function or how they're developed. How can someone know that they might enjoy developing electronic controls, when the subject is not even touched during their school career? Obviously, in view of the

rapid expansion in knowledge, only a fraction of topical issues can be tackled in school, that much is clear. So control engineering is just one example among many, though it is one of particular interest to dSPACE. What dSPACE above all can and will do is to provide hands-on experience in technology in the broadest sense of the word and stimulate technical interest. And we can do it well: by giving exciting presentations in physics classes, for example, hosting school visits to our facilities, or supporting projects like the hybrid bicycle. With the experience we have had of ProMINT projects so far, I'm very confident that we already strengthened several young people in their decision to study a technical or scientific subject. And if they later turn into young dSPACE engineers, I'll be even more pleased.

Thank you for talking to us, Mr. Schütte.

ProMINT

With the ProMINT initiative (mathematics, informatics, natural science, technology), dSPACE is making an active contribution to nurturing the next generation of engineers and scientists. As part of ProMINT, dSPACE is involved in organizing physics and computer science lessons in schools, and also provides university grants.

www.promint.de (German version only)