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Active pedestrian protection with a vehicle

Professions: *Christian Bräuchle was toying with thoughts of leaving his homeland behind, but then changed his mind. "Guilty" for that was Heilbronn's course of study Automotive Systems Engineering, which paved the way for the 28 year old to climb into the profession and seek his PhD.*

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That he would study something technical was always clear to Christian Bräuchle. Just what? How good it was that there was Heilbronn's course of study Automotive Systems Engineering, a mixture of mechanics, electronics, computer science, and even other things too. At present, Bräuchle is working for Bosch and doing his PhD. With his work the 28 year old will make the lives of pedestrians safer. For that he needs precisely this interdisciplinary knowledge from his studies.

Christian Bräuchle has found the entry point into his profession. Thereby he avoids hitting things—at least that is the aim of the auto-driving researcher Bräuchle.

Life on German roads will be safer. In the first half of 2013, there were fewer fatalities and injuries than in the first six months of 2012. So continues the positive trend. In total the proportion of fatalities in traffic mishaps is decreasing. Drivers and passengers are safer.

But more pedestrians are dying. In Baden-Württemberg (ed: southwestern German state next to France and Switzerland, home of Mercedes and Porsche) 39, thus a third more compared with the first half of 2012. Christian Bräuchle makes life for pedestrians safer with the help of modern technology. "If braking is not enough, the vehicle steers automatically away from the pedestrian." The engineer works for Bosch and develops in his PhD project an active driver assistant system to prevent collisions with pedestrians.

Driving behavior, infrastructure, and automotive engineering are cited by professionals as the reason for the decrease in traffic accidents. In new automobiles there's a lot of technology for the safety of traffic participants. Cruise control keeps the car at the desired constant speed and also keeps it at a pre-specified distance from the vehicle ahead.

Both are standard in modern vehicles. "The function of an emergency braking system is covered from a technical standpoint for the most part. But what about when an emergency stop for a pedestrian doesn't suffice?" asks Bräuchle. Then there's the alternative: turning to avoid the pedestrian.

Bräuchle comes for the region around Heilbronn, attended a technical high school, graduated from a course of study for basic military service, and then went to Heilbronn Polytechnic in Automotive Systems Engineering. (ed: Heilbronn is a small city in southwest Germany, not far from Stuttgart.)

"Really I had planned to leave Germany to go see something else of the world." But then he found this area of study that combined mechanical and electrical engineering with computer science more interesting than his desire to change his surroundings.

In this course of study students study the vehicle as a total system, consisting of both hardware and software components as well as their communication with each other. Braking and steering are directed from software. To work in this area one has to understand the associated engineering. The communication between control devices is a concrete example of software for automobiles.

In March 2010 Bräuchle finished his studies at Heilbronn Polytechnic and went to work in the neighboring village of Abstatt. There Bosch has a development center for undercarriages. Bräuchle works there in concept development.

He was already involved with Bosch during his studies. He completed a half-year internship with Bosch in Japan; then he wrote his undergraduate thesis involving a project at Bosch. During this time he made the necessary contacts to get the position at Bosch for doing his PhD research. This will last four years and is directed from the University of Tübingen (ed: also in southwest Germany). "I hope that with my PhD I shall be well prepared for my coming career. My technical spectrum is awaited at Bosch."

He got a Diplom degree in engineering at the Polytechnic. (ed: This is a degree between a bachelors and a masters degree in the U.S.) But his PhD work is strongly in the direction of computer science. "Looking back on it today, I see that studying computer science at a research university would have been an alternative." Computer science because of the content, a research university because of the fundamental and less practically oriented study compared with a polytechnical university.

Bräuchle in his work has to deal often with fundamental conflicts, for example data collection and processing. In a vehicle data comes in from a number of video cameras. Then it is processed further in a simulation analysis in a computer.

In the simulation there are movement models for pedestrians and behavior patterns for the driver. In a fraction of a second the program works out different alternatives and steers the vehicle around the pedestrian. “Fortunately I have many colleagues at Bosch , among them many who are proven experts in their fields, with whom I can exchange ideas.”

Competent colleagues in various technical fields is one of the good sides of a company with over 300,000 employees. The multiplicity of people and processes is overwhelming. “This can be frightening for a new employee,” says Bräuchle. But one gets accustomed to all those forms and with time comes to understand how big organizations work.

Additionally, employees in a large concern have more possibilities that in mid-sized firms. Bräuchle hopes “to be able work on similar interesting projects” after he gets his PhD. In the near future he’d like to take a role in directing research.