The Copenhagen Wheel

Description

Function
Developed by a small team of students at the SENSEable City Lab, MIT, The Copenhagen Wheel is a new emblem for sustainable urban mobility that improves the cycling experience, offers a cost-effective transportation alternative to cars and fosters a community of cyclists in cities. Smart, responsive and elegant, it transforms existing bicycles quickly into hybrid electric-bikes with regeneration and real-time sensing capabilities. Its sleek red hub not only contains a motor, batteries and an internal gear system – helping cyclists overcome hilly terrains and long distances - but also includes environmental and location sensors that provide data for cycling-related mobile applications. Cyclists can use this data to plan healthier bike routes, to achieve their exercise goals or to create new connections with other cyclists. Through sharing their data with friends or their city, they are also contributing to a larger pool of information from which the whole community can benefit.

Inspiration
Visitors to Copenhagen are always struck by one thing: the number of people who cycle. However, although this city has the infrastructure and policies in place, the percentage of people who ride daily (36%) has remained virtually constant for the last ten years. Inspired by creating more livable and sustainable cities, our team began working with the municipality of Copenhagen in 2008 to investigate how...
small amounts of technology could improve the cycling experience and how the four main obstacles to getting people on bikes - distance, topography, infrastructure and safety – could be overcome. What has resulted is the Copenhagen Wheel: a new type of electric smart-bike which utilizes a technical solution for overcoming distance and topography (a motor and batteries with regeneration capabilities that can provide riders with a boost when needed) and a real-time data network and series of applications to support infrastructure creation and foster a sense of safety.

Development
The vision for the Copenhagen Wheel - to provide a leap-frog, plug-and-play solution that improves the cycling experience - was initially generated in a student workshop held at MIT. From here, a multi-disciplinary team of students that includes architects, urban designers, mechanical and electrical engineers and computer scientists was formed. Unveiled in Copenhagen at the COP15 United Nations Climate Conference our latest prototype has garnered much interest from mayors who wish to implement fleets of these bicycles in their cities as well as individuals who wish to purchase a wheel. We are now custom building parts and refining the electronics and control system to ensure a safe and reliable product - items that our technical partner, Ducati Energia of Italy, is helping us to achieve. We are also spinning the technology out of a university environment so that it is ready for market in approximately 12 months time with an estimated cost of $600 per wheel.