COMPANY
Pedal Logic
pedallogic.com

LOCATION
Lafayette, California, United States of America

SOFTWARE
Autodesk® Product Design Suite Ultimate
Autodesk® Inventor®
Autodesk® Showcase®
Autodesk® Fusion 360™

Pedal Power

Innovative Technology from Pedal Logic Makes Accelerator Pedals "Smarter" for Greener Driving

"The Fusion 360 tool has collaboration functionality that organizes and manages our processes very effectively, so that we can focus more on high-value design and less on low-level project management."

—**Marc Lurie**
CEO, Pedal Logic



Marc Lurie of Pedal Logic developed the ECO+ with Autodesk® Product Design Suite and Autodesk® Fusion 360™ software. Image courtesy of Pedal Logic and Lee Fawkes.

Introduction

Whether you're driving on a bumpy country road or a smoothly paved highway, your foot constantly makes small unintentional movements on the accelerator pedal.

Just a harmless annoyance? Hardly: these unwanted pedal movements reduce your mileage up to 10% if you're in a typical passenger vehicle—and even more if you're in a truck or heavy vehicle.

The challenge

Marc Lurie, CEO of Bay Area-based company Pedal Logic, wondered if an intelligent device could distinguish between intentional and unintentional pedal movements in order to improve mileage and efficiency.

With his curiosity piqued, Lurie assembled a team, and set to work developing a solution. The result is the ECO+, a ruggedized, plastic-encased computing device about one-inch (2.5 cm) square, or the size and shape of an iPhone wall charger, that easily installs on top of a motor vehicle's accelerator pedal.

By monitoring overall vehicle motion, the ECO+ can determine whether a pedal movement was wanted or unwanted—and then make sure that fuel is only injected into the engine when a deliberate foot motion occurs. The entire process is undetectable by the driver.

Coming up with the design for such a tiny but powerful device presented several challenges. "We have a limited amount of space in which to fit a large number of chips and circuits," said Attila Vass, vice president of research and development at Pedal Logic. "At the same time, we needed something water and dust resistant that an operator's foot couldn't accidentally crush or kick off the pedal."

The solution

Pedal Logic found that outsourcing mechanical engineering was slowing its development process, so the company made the decision to bring the development process in-house.

"We realized that if we had the right tools, we could handle a lot of the design and engineering ourselves," said Lurie. "The Autodesk® Cleantech Partner Program was a real godsend for our organization in that regard."

The Autodesk Cleantech Partner Program supports clean technology innovators with design and engineering software they can use to accelerate their development of innovative solutions to the world's epic challenges. For more information, visit **autodesk.com/cleantech.**

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Accelerating the design of a product that could save millions of dollars of fuel per year

Through the Autodesk Cleantech Partner Program, Pedal Logic gained access to software tools like Autodesk® Product Design Suite Ultimate and Autodesk® Inventor®. The software helped speed the design process by creating digital prototypes of the ECO+, which they could easily 3D print to rapidly test out new ideas and approaches. "Autodesk Inventor helped us enormously in the iterative process," said Lurie. "Looking back on the number of times I made iterations to various vehicle-specific versions of the ECO+, I would say it cut six months off our development timeframe."

Pedal Logic has also taken advantage of Autodesk® Showcase® 3D presentation and visualization software—another tool within the Product Design Suite offering—to create rendered images for use in presentations and marketing documents. "With Showcase software, we can create very detailed renderings of the ECO+," said Lurie. "More than just gorgeous, they are extremely useful to include in white papers and other documentation that we submit to prospective customers or government agencies."

Lurie also uses Autodesk® Fusion 360™, a cloud-based 3D CAD/CAM tool, to design thermoplastic housings for his company's automotive electronics. "It's a useful design tool for mechanical design projects of basic to moderate complexity," said Lurie. "We realized pretty quickly that the user interface and toolset of Fusion 360 could save a lot of time and effort. The push-pull commands are one of our favorite features."

Additionally, Lurie found that the collaboration tools of the Autodesk Fusion 360 tool were ideal for the type of iterative design the company regularly engaged in. "Previously, I group emailed STP files to gather feedback on each iteration," said Lurie. "Fusion 360 has collaboration functionality that organizes and manages these processes very effectively, so that we can focus more on high-value design work and less on the low-level project management."

The result

Pedal Logic will release the ECO+ in Q2 of 2015, with an initial focus on direct sales to commercial fleet operators and defense manufacturers, although its potential is much broader. "The top 100 U.S. fleet operators roll over a million vehicles on the road daily," said Lurie. "Since the ECO+ can save commercial fleet operators about $300-$600 a year in fuel costs per vehicle, the savings rapidly add up: an operator with a fleet of 5,000 vehicles, for example, would save $2-$3 million per year on fuel costs. We think that's a conversation they'll be interested in having, and we will work with channel partners to address the global market more broadly, including the 80-90 million consumer and light vehicles sold annually."

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The ECO+ installs on a vehicle's accelerator in about 5-10 minutes. Image courtesy of Pedal Logic and Lee Fawkes.



3D printed prototype of the ECO+. Image courtesy of Pedal Logic and Lee Fawkes.

For more information

To learn more about the Autodesk Cleantech Partner Program, visit **autodesk.com/cleantech.**

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