# Abstract

The Brilliant Pad is an automated self-cleaning dog potty system, that removes the hassle of cleaning up after pets by wrapping and sealing waste in a Brilliant Pad roll. Although convenient, the Brilliant Pad is limited to advancing the pad either once, twice, or three times a day based on user preference, rather than optimally advancing the pad as soon as waste is present on the roll. This implementation leads to prolonged odor and waste of clean pads. We aim to improve the existing product with a vision system that addresses these limitations. This vision component is comprised of a Raspberry Pi and a Pi Camera, which allow the Brilliant Pad to intelligently determine the amount of waste currently on the pad. Using OpenCV, the Raspberry Pi is able to process and analyze a stream of images from the Pi Camera in order to calculate a soil level based on how much waste is on the pad. With our implementation, users will be able to specify a percentage of waste that will determine when the Brilliant Pad should advance to seal the waste. Ultimately, this addition to the Brilliant Pad will increase usability of the product by fixing its primary downsides.

* Avoid passive voice
* Try to reduce clutter

The Brilliant Pad is a self-cleaning dog potty that removes the hassle of cleaning up after pets through its automatic pad dispensing and sealing system. Although convenient, the Brilliant pad still has some pet peeves: it currently advances the pad at a user-defined time interval regardless of the amount of waste on the pad. This leads to a waste of clean pads, prolonged odor, and higher maintenance. We aim to improve the existing product with a vision system that can tell the pad to advance when a user-defined waste threshold is reached. Our vision system makes use of a Raspberry Pi, Pi Camera, and OpenCV to determine the level of waste detected. To make the system more robust, we also explore methods to more reliably detect dog presence. These additions to the Brilliant Pad will help assess the feasibility of a camera system to improve the user experience and serve as a basis for potential commercial adoption.