

# Robot for Power Line Vibration Control

## VTIP 20-084: “Self Powered Autonomous Robot for Power Line Vibration Control and Inspection”

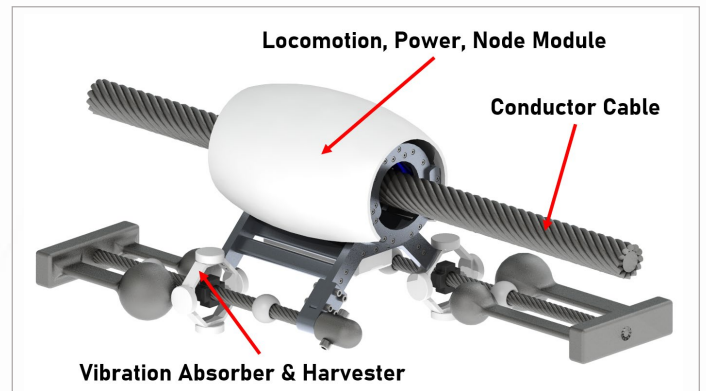
### THE CHALLENGE

Wind induced vibrations are a major concern in engineering structures like power lines and suspended cables. Often the result of inclement weather, these vibrations result in annual outage costs of between \$18 and \$33 billion according to the Department of Energy. While conventional methods include fixed passive vibration absorbers, they are not able to adapt to changing weather conditions and thus leave significant room for improvement.

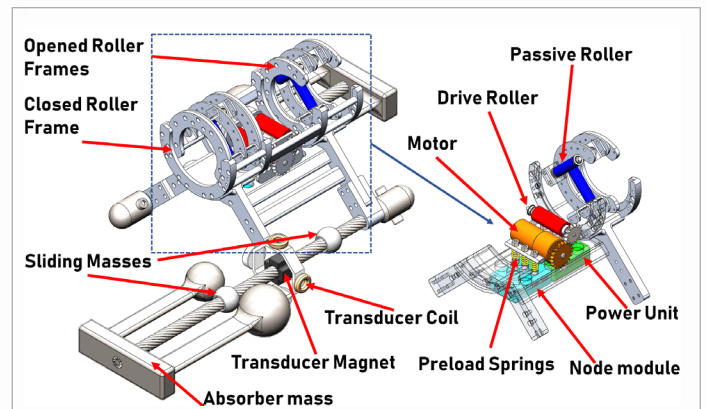
### OUR SOLUTION

Oumar Barry and his team at Virginia Tech have developed a self powered robot capable of damping these vibrations and also conducting overhead line inspection. Given the light weight, compact, and self-powered design, the robot can be permanently mounted on power lines. By sensing ambient wind characteristics, it is able to identify the location of the anti-node, slide along the cable to that location, and optimally damp the vibrations.

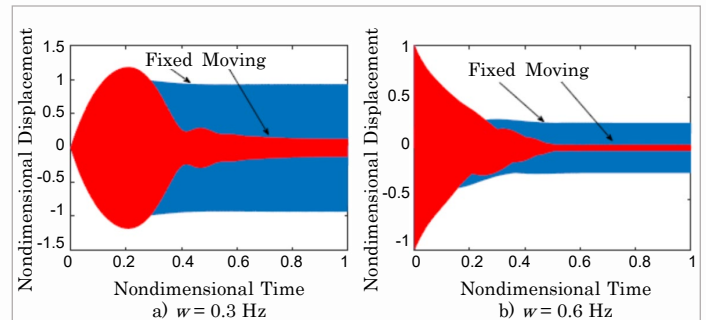
The design can also be modified for similar applications in suspension bridges, gas pipes, and other difficult-to-access environments where weather-induced vibrations can cause structural damage.



The powerline vibration control robot.



Interior structure and major components of the robot.



Performance difference between a fixed damping device and a mobile vibration damper.



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