The Solar Blueboat

Figure 1: BlueBoat with 180W solar charging system.

The Solar BlueBoat project advances research in energy-aware autonomy for solar powered ASVs. Using the MOOS-IvP autonomy framework, the project develops behaviors to regulate vehicle speed and heading based on real time power usage, solar input, and mission objectives. Algorithms account for sun position, solar weather conditions and time of day, ensuring the ASV preserves sufficient energy for overnight survival while maximizing mission performance.

Alongside the autonomy development, the project implements a 180W solar charging system integrated with the onboard batteries. A power sensor connected to the BlueBoat navigator board allows for accurate power readings of solar input, enabling direct coupling between solar charging and autonomy behaviors.
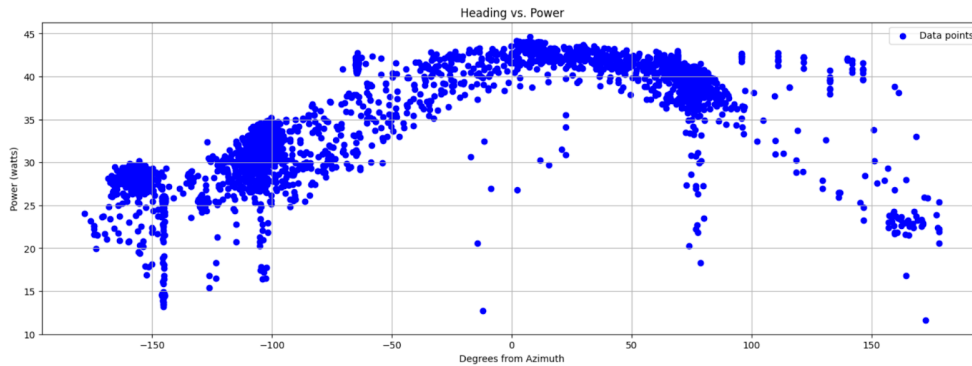

Figure 2: Relationship between ASV heading relative to solar azimuth and measured 50W solar panel power input, showing a cosine dependence.

Status:	Ongoing since Spring 2025
People:	Ethan Phan, Jeremy Wenger, Raymond Turrisi, Mike Benjamin (PI)
Sponsors:	MIT UROP Office
Software:	MOOS-IvP, https://moos-ivp.org
	ArduRover, https://ardupilot.org
	BlueOS https://blueos.cloud
Robots:	The Blueboat https://oceanai.mit.edu/pavlab/robots/blueboat