HiWi – Bachelor - Master Thesis

Storing small amounts of energy for wildlife tracking purposes efficiently

Background:

Wildlifetrackers are an essential tool to gather information about certain animals like the wolf or lynx. Attached to the desired animal, they monitor and gather information such as position and activity. The lifetime of the tracker is restricted by the included batteries which normally can't be exchanged during long term studies.
We aim to build a fully energy-autonomous tracker that solves this problem. Our approach harvests electric energy from the temperature-gradient between the mammal and environment while lowering power consumption of the components to the possible minimum.
As the input power of such harvesting systems are in general much lower than the power consumption of the components in active mode, the incoming energy has to be stored up to the point, where enough is available to run the system.

Tasks:

In our team, you will focus on the description and improvement of the energy management system, including:

- Finding and analyzing energy storage concepts, including new types like hybrid capacitors, with regard to energy efficiency and power income
- Optional: Developing a state-of-charge determination for your system
- Optional: Adapt your findings and integrate them in the wildlife tracking system

With this work, you will contribute to our wildlife tracking system and you will gain various practical skills that are commonly needed in microsystems engineering. Experience in electronic circuit design is an advantage for fulfilling this task.

This position is available for one motivated bachelor/master student who starts as a HiWi and wants to do his/her bachelor/master thesis on this. Interested students are welcome to contact us. More information about the tracker and the project can be found at www.iottracker.de.

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