

ES 2: Critical thinking with Python

aka, Introduction to Computing for Engineers

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10 April 2025



SCIENCE

Solar panels that can generate electricity at night have been developed at Stanford

April 7, 2022 · 7:00 AM ET

RINA TORCHINSKY



(Thanks to EEVblog)

PV (photovoltaic, aka solar panel)

TEG (thermo-electric generator)

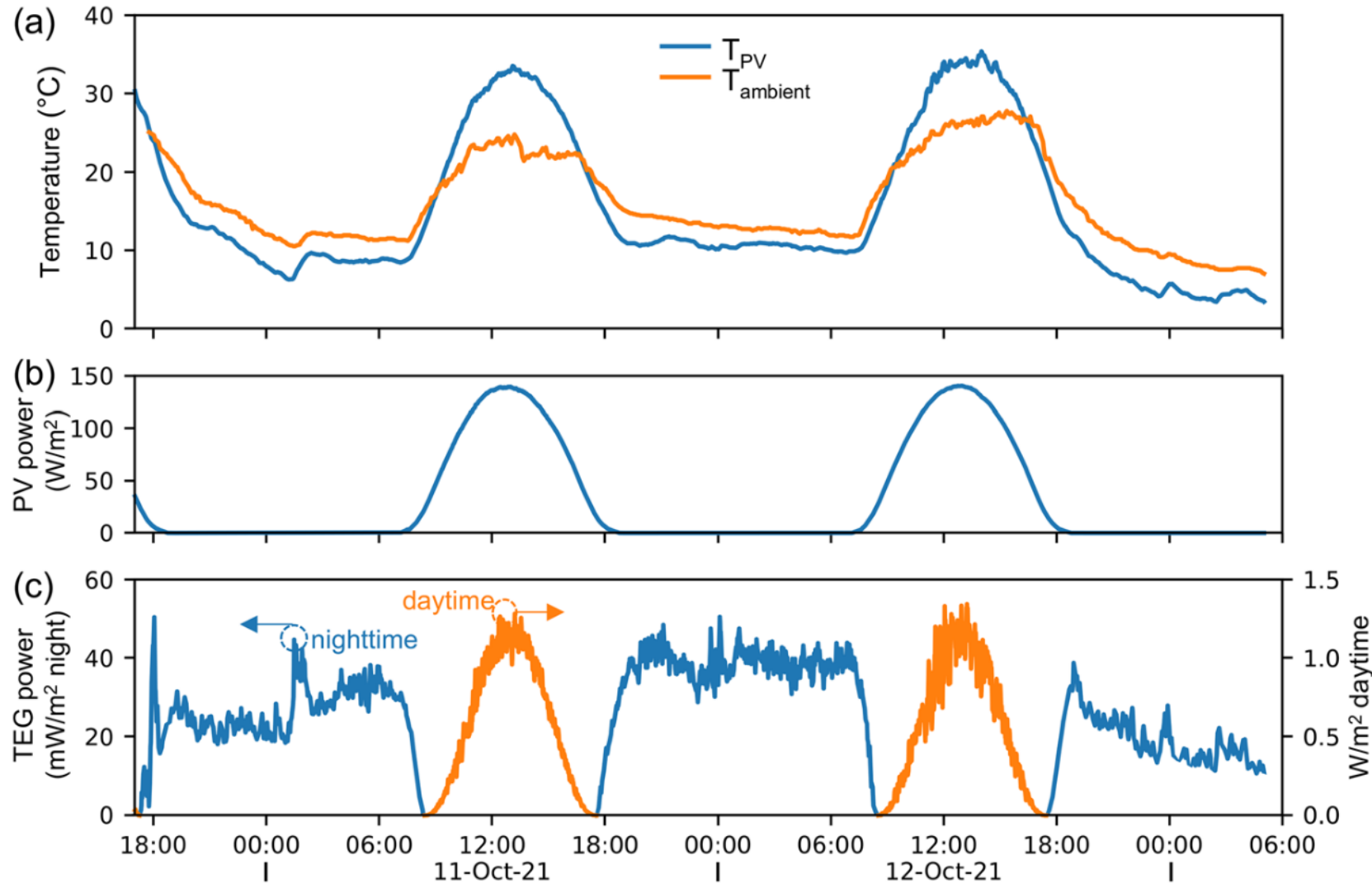


FIG. 3. Multi-day temperature and power measurements. (a) Temperature measurements. (b) PV power generation. (c) TEG power generation. Note the different scales used for daytime and nighttime. (d) Snapshot of the TEG's current-voltage-power relationship at 8:50 pm on October 11.

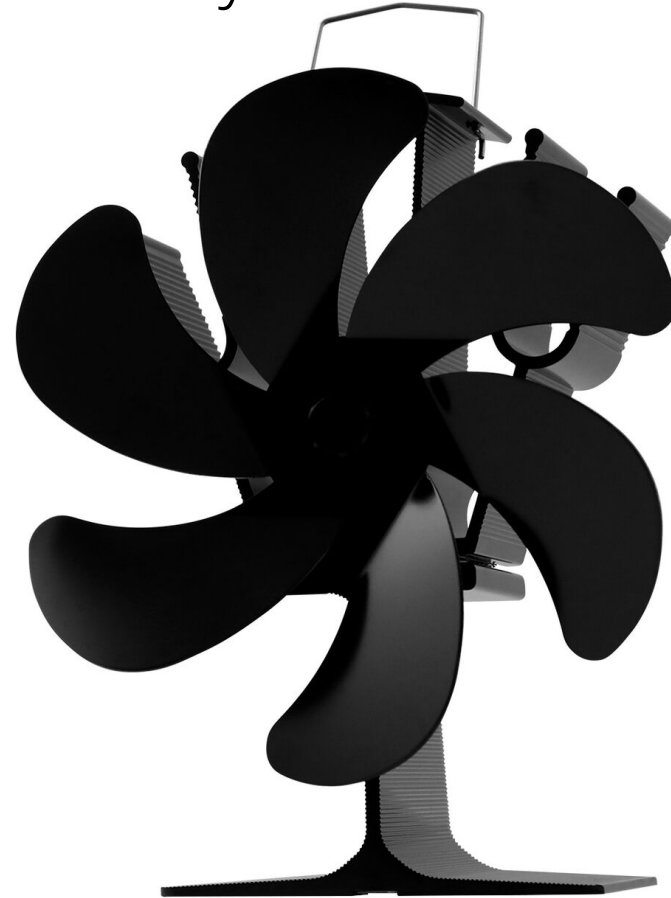
What is a TEG?

Thermo-**e**lectric **g**enerator

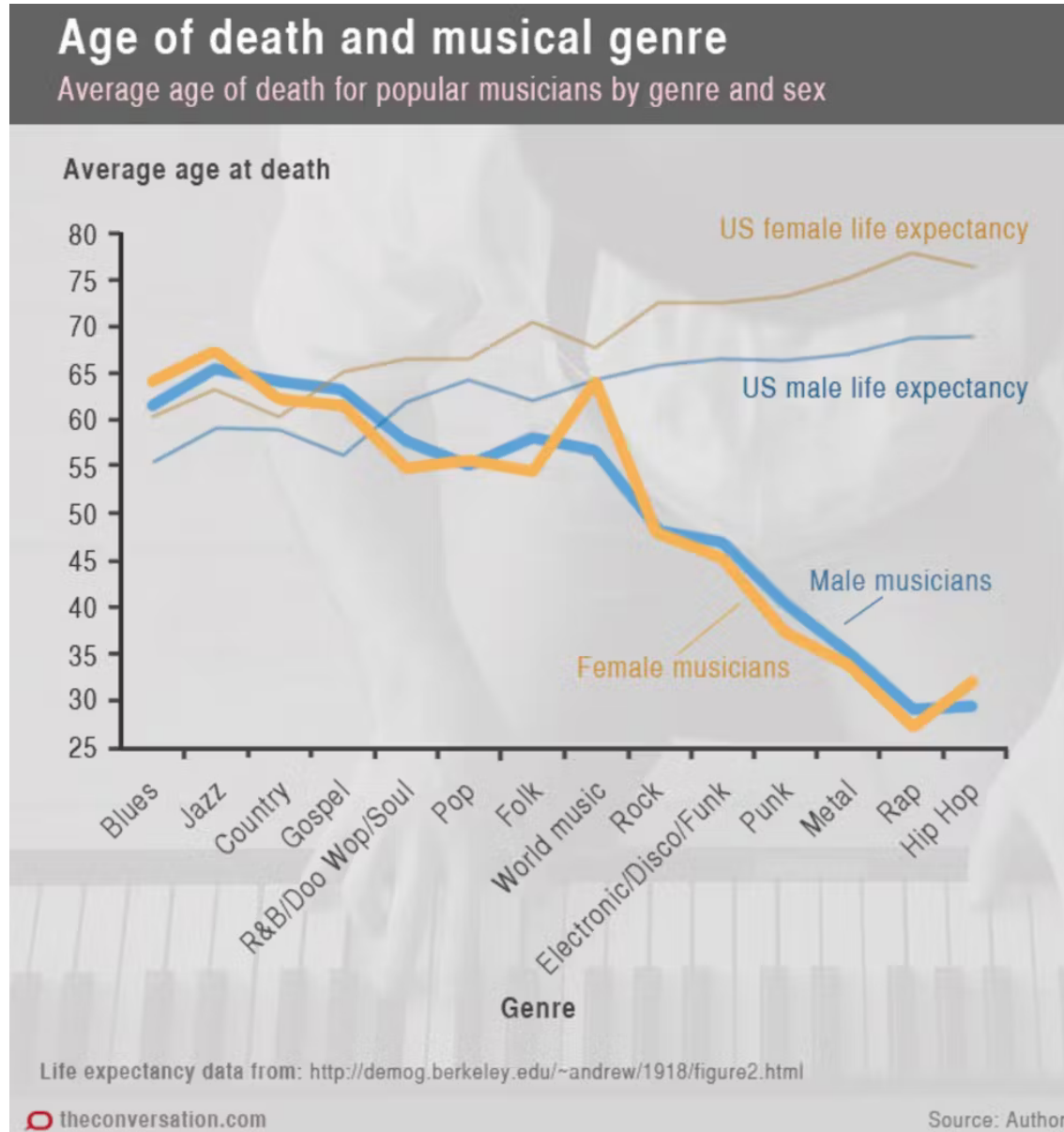
Use a thermal difference to generate electricity

Run it backwards and you get a

Peltier heater/cooler



Music to die for



Music to die for

<https://theconversation.com/music-to-die-for-how-genre-affects-popular-musicians-life-expectancy-36660>

Monte Carlo simulation

Simulation is handy when the math is complicated (and nonlinear)

- Fluid dynamics

- Finite element analysis

- Complex electrical circuit analysis

But what if there is uncertainty?

- Weather / storm tracking

- Travel times

Due dates

Signal processing / ECG problem due next Monday (4/14)

Travel time problem due Monday 4/21