

Developing acoustic localization for wildlife in environmental impact assessment

Lucas Voirin, André Desrochers, Marc J. Mazerolle



Faculty of Forestry,
Geography and Geomatics



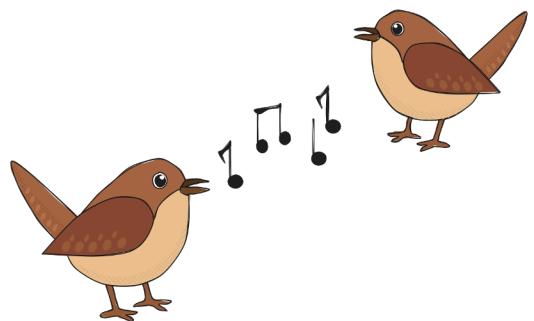
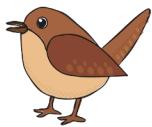
Assessing impacts



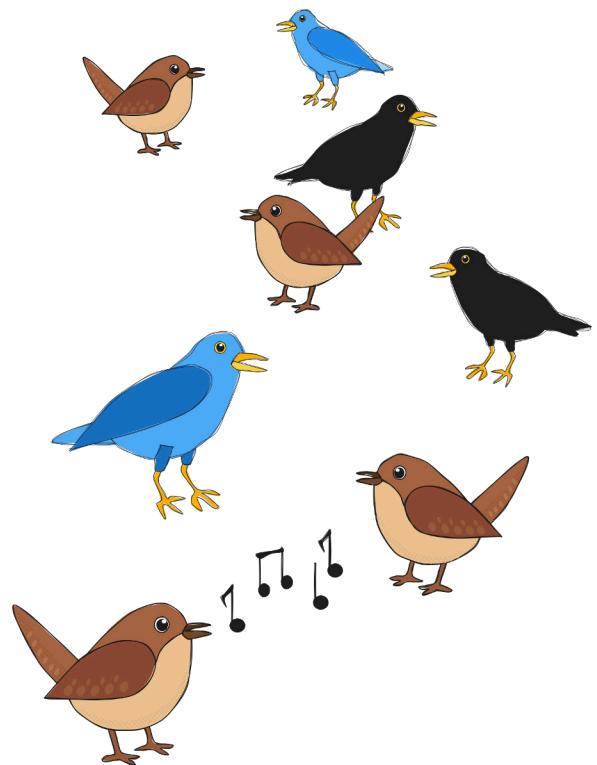
Challenges in sight



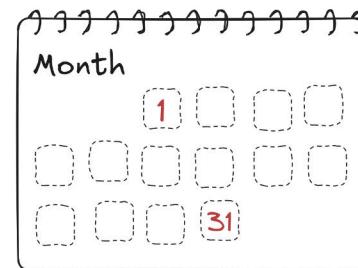
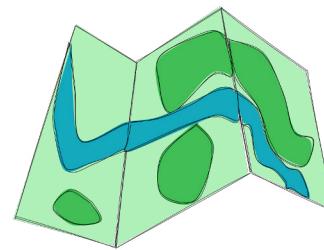
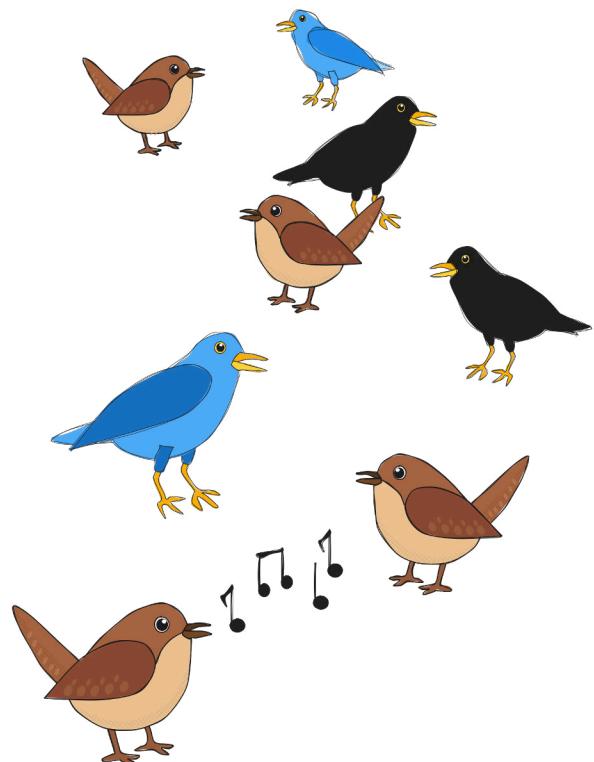
Challenges in sight



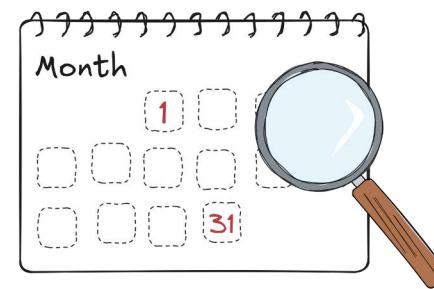
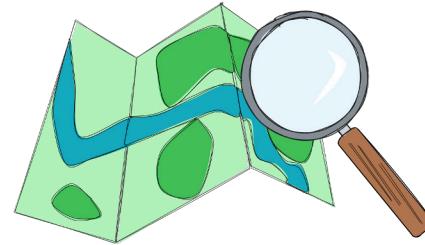
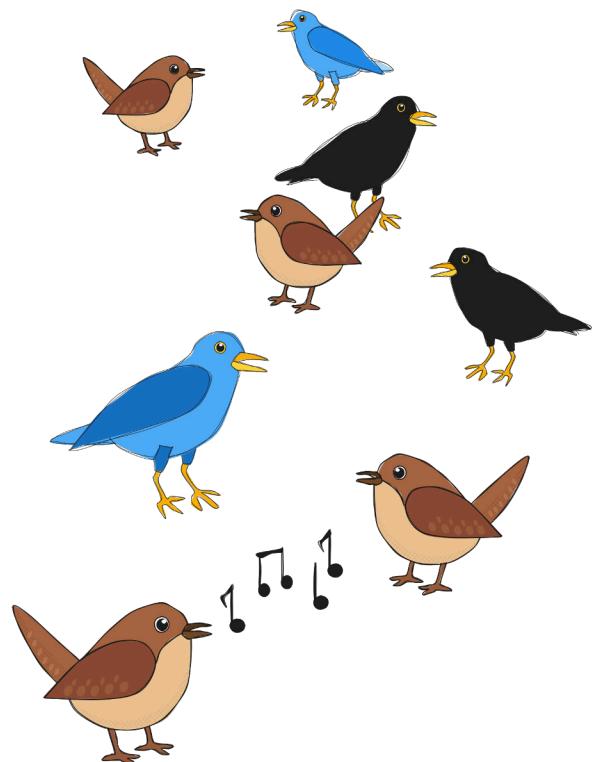
Challenges in sight



Challenges in sight



Challenges in sight

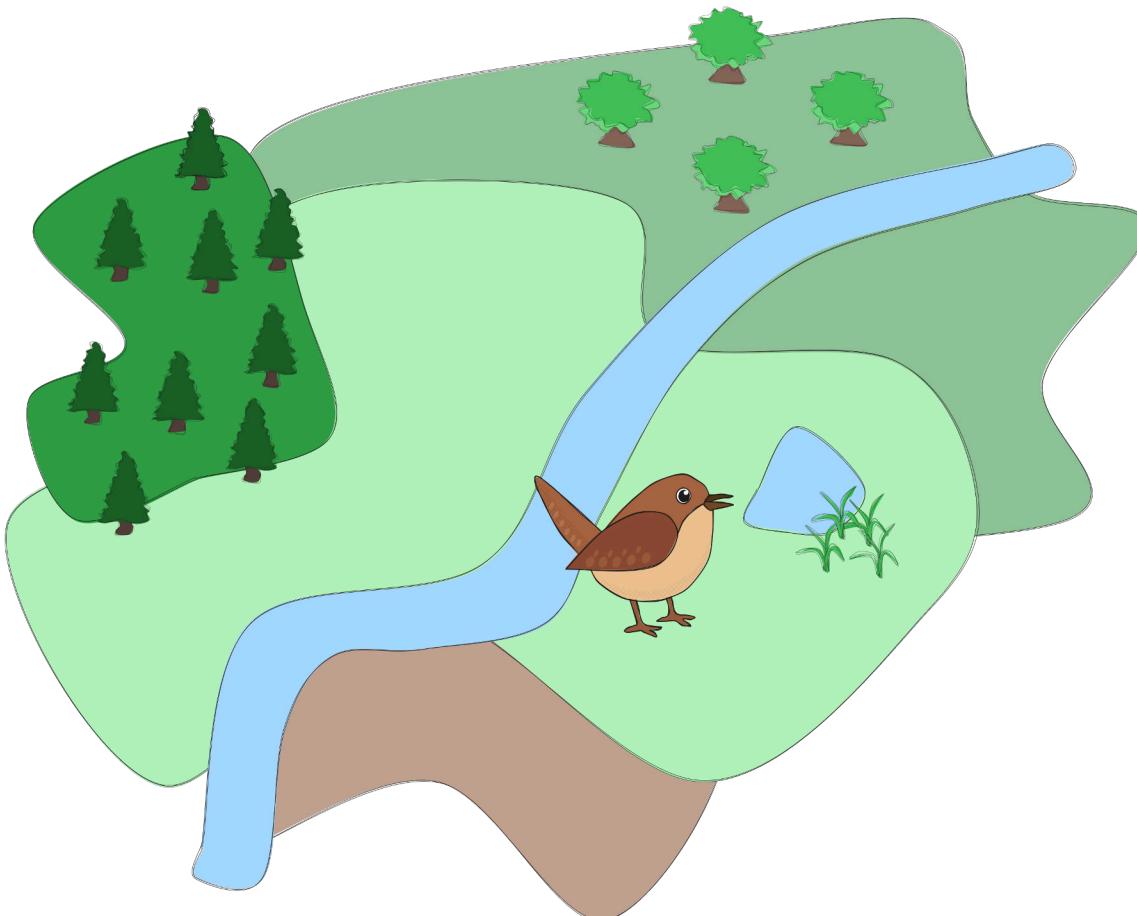


Behavioral insights

Mennill et al. (2006), Dutilleux, Sandercock, and Kålås (2023), Teixeira, Maron, and Rensburg (2019)



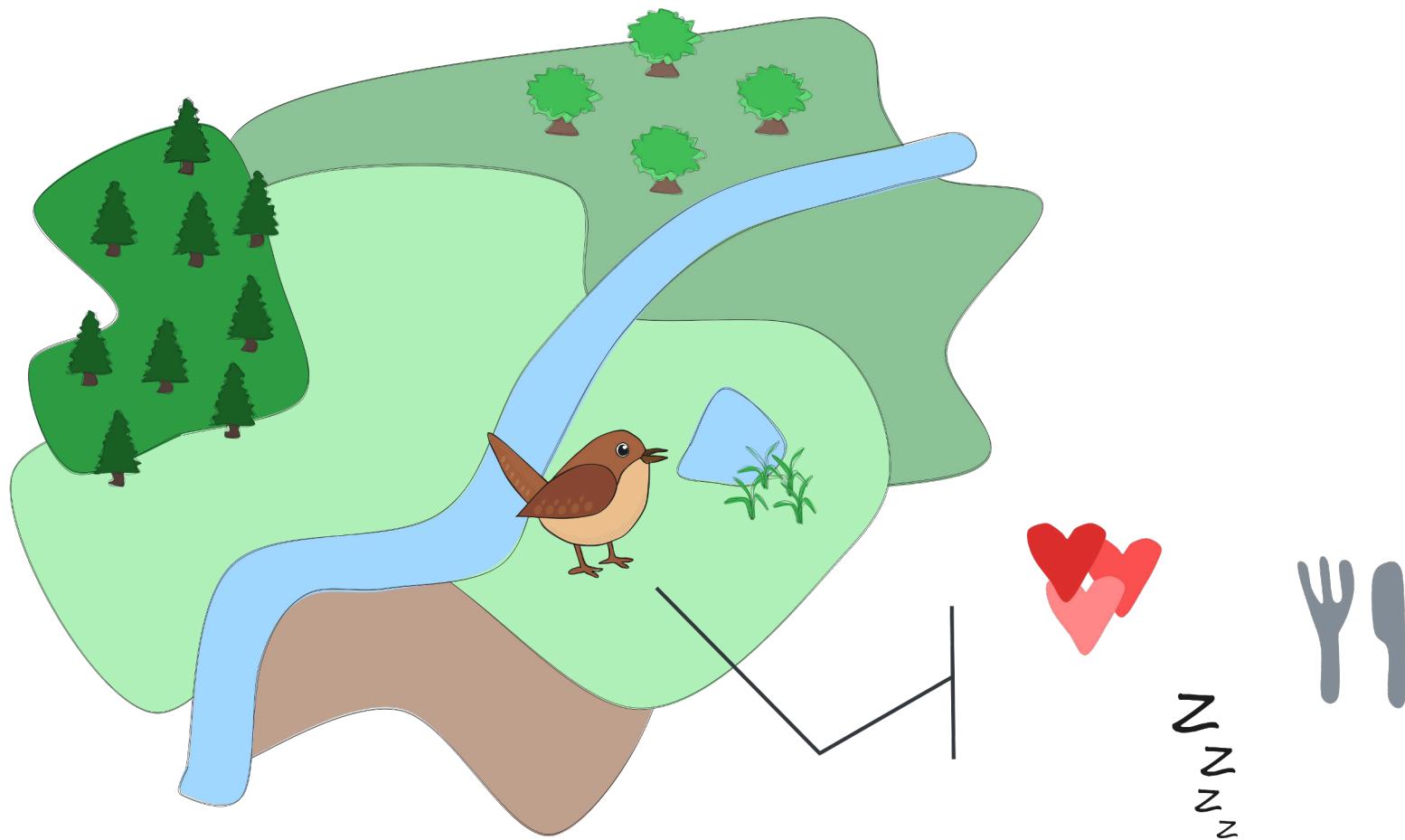
Behavioral insights



Mennill et al. (2006), Dutilleux, Sandercock, and Kålås (2023), Teixeira, Maron, and Rensburg (2019)



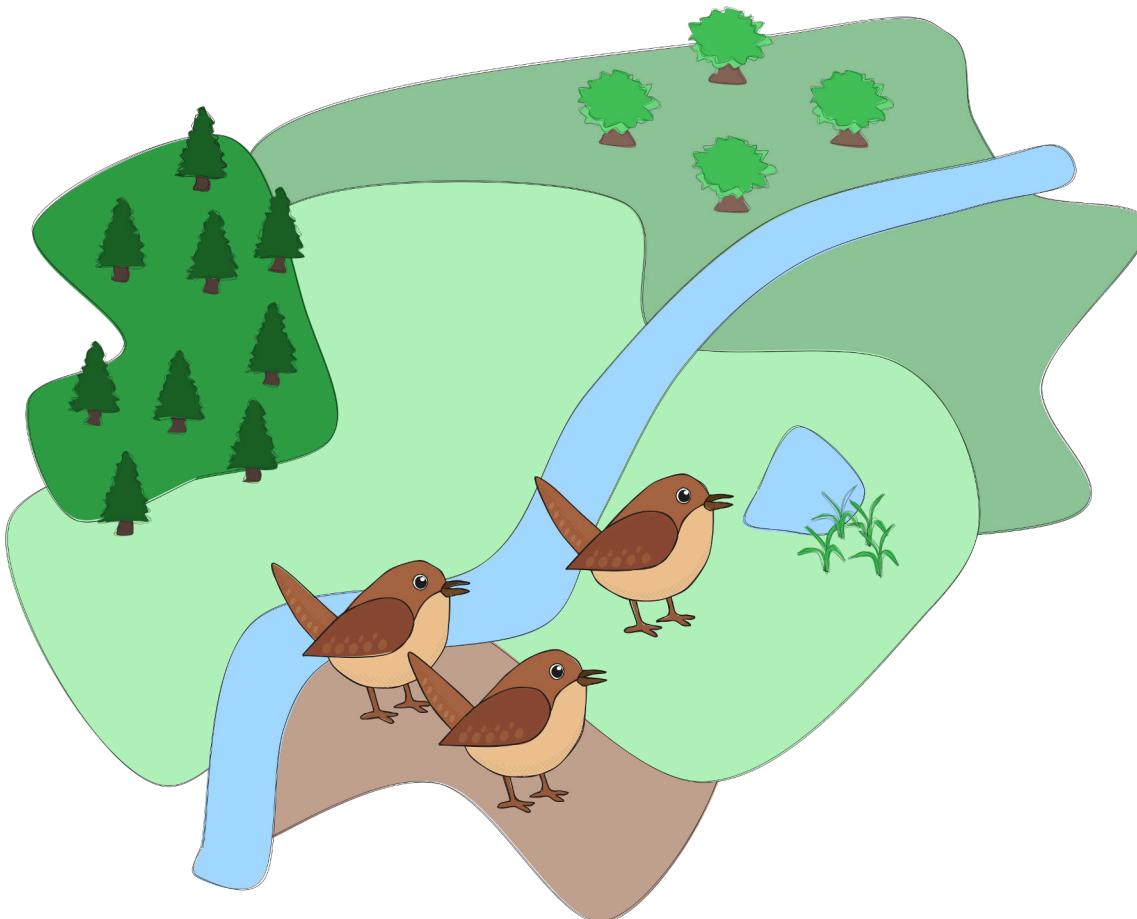
Behavioral insights



Mennill et al. (2006), Dutilleux, Sandercock, and Kålås (2023), Teixeira, Maron, and Rensburg (2019)



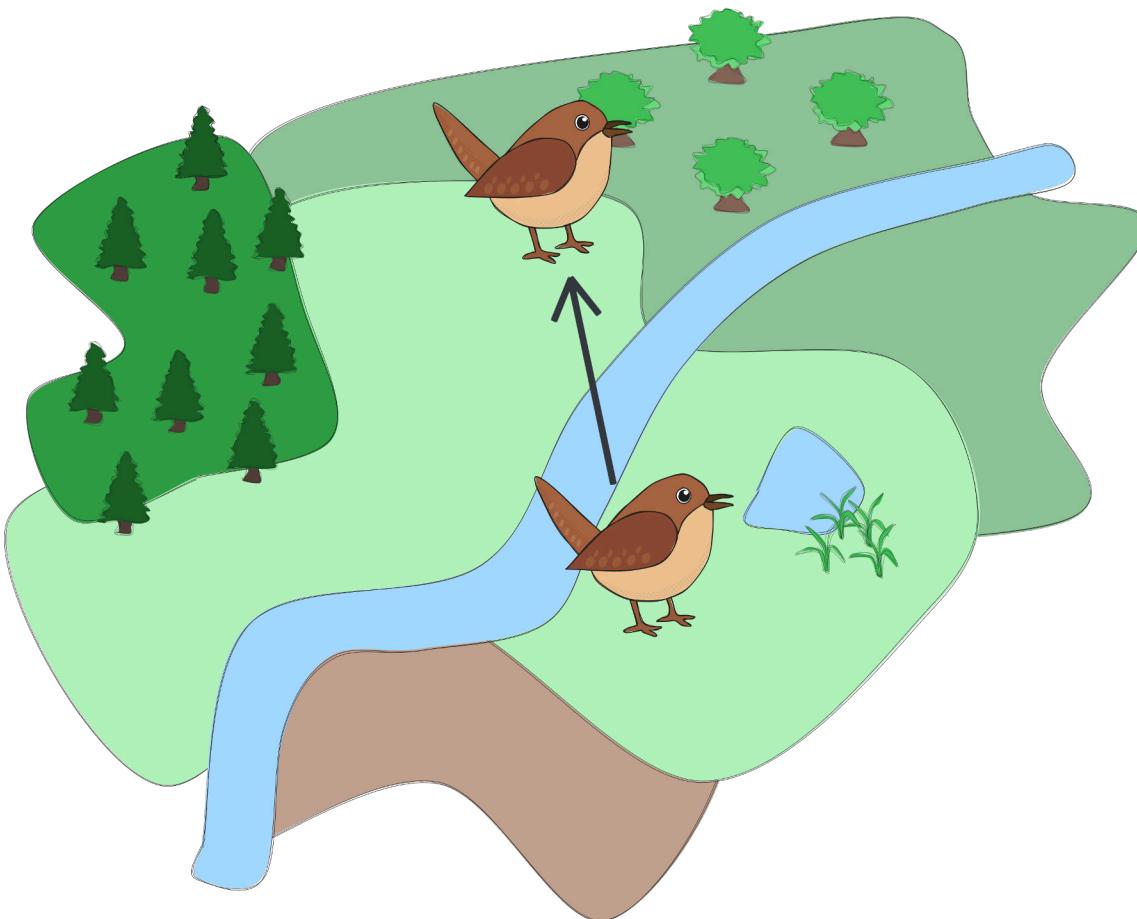
Behavioral insights



Mennill et al. (2006), Dutilleux, Sandercock, and Kålås (2023), Teixeira, Maron, and Rensburg (2019)



Behavioral insights



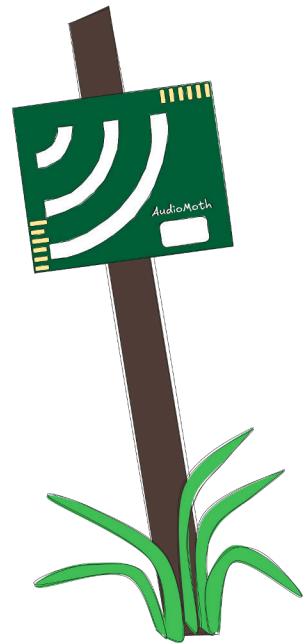
Mennill et al. (2006), Dutilleux, Sandercock, and Kålås (2023), Teixeira, Maron, and Rensburg (2019)



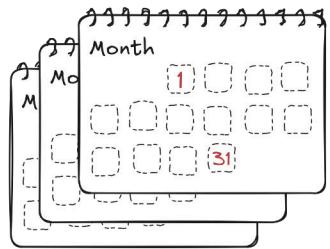
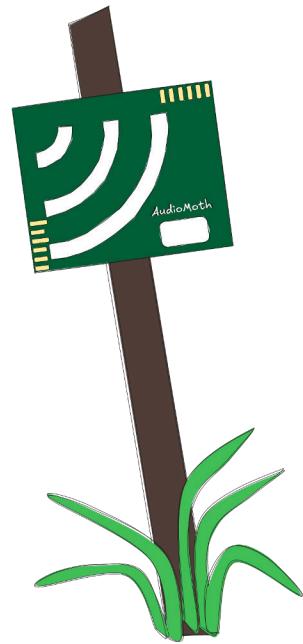
From sight to sound



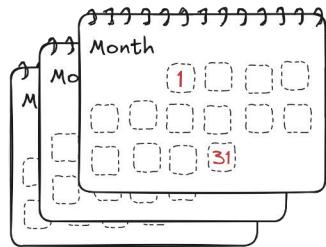
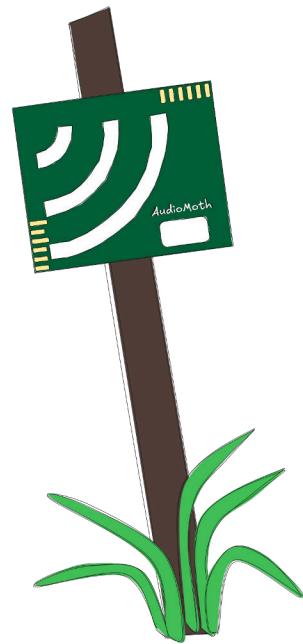
From sight to sound



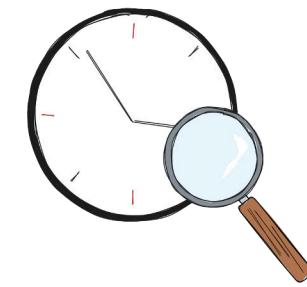
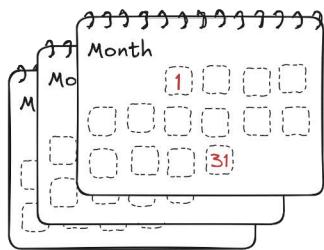
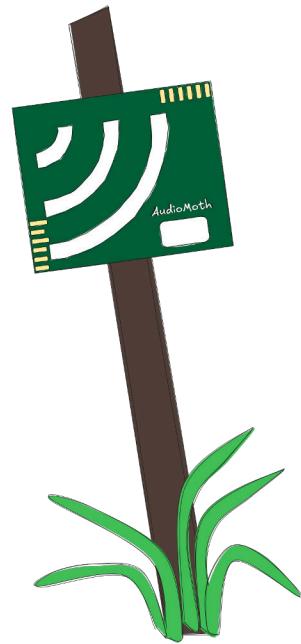
From sight to sound



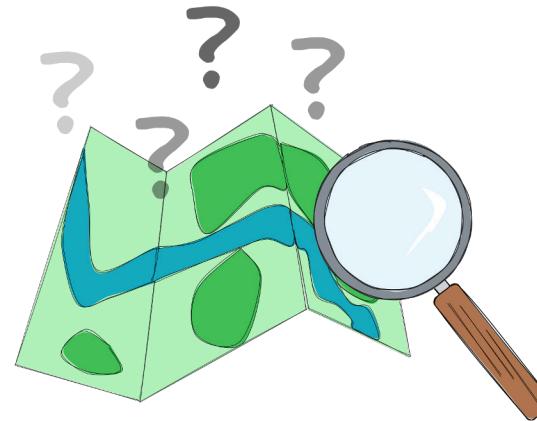
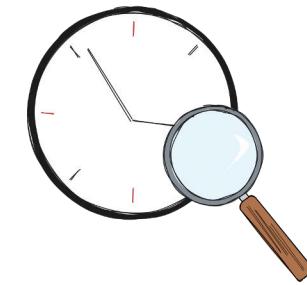
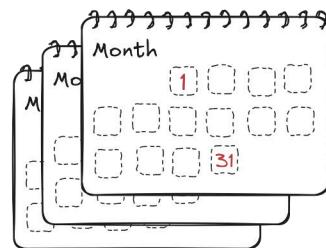
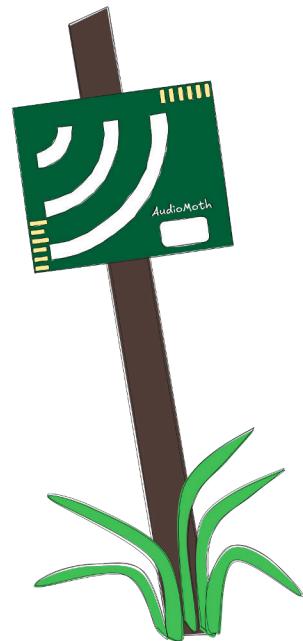
From sight to sound



From sight to sound



From sight to sound



Localizing sounds



On the field



On the field



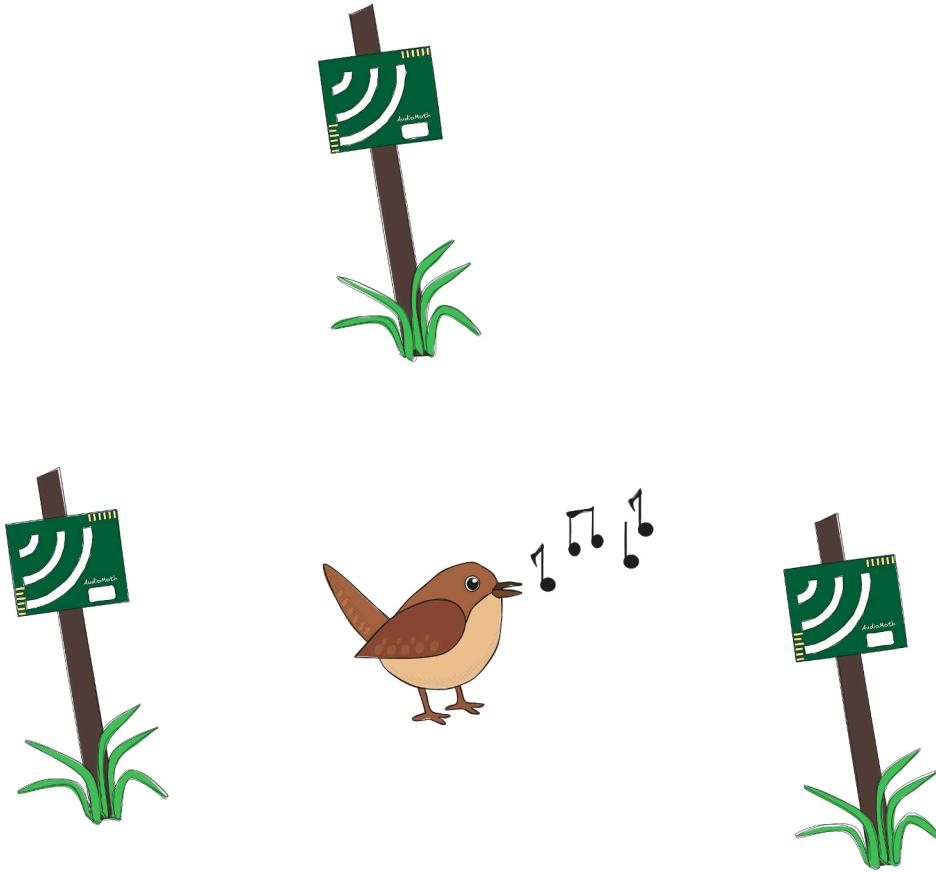
Multiple microphones



Time synchronization



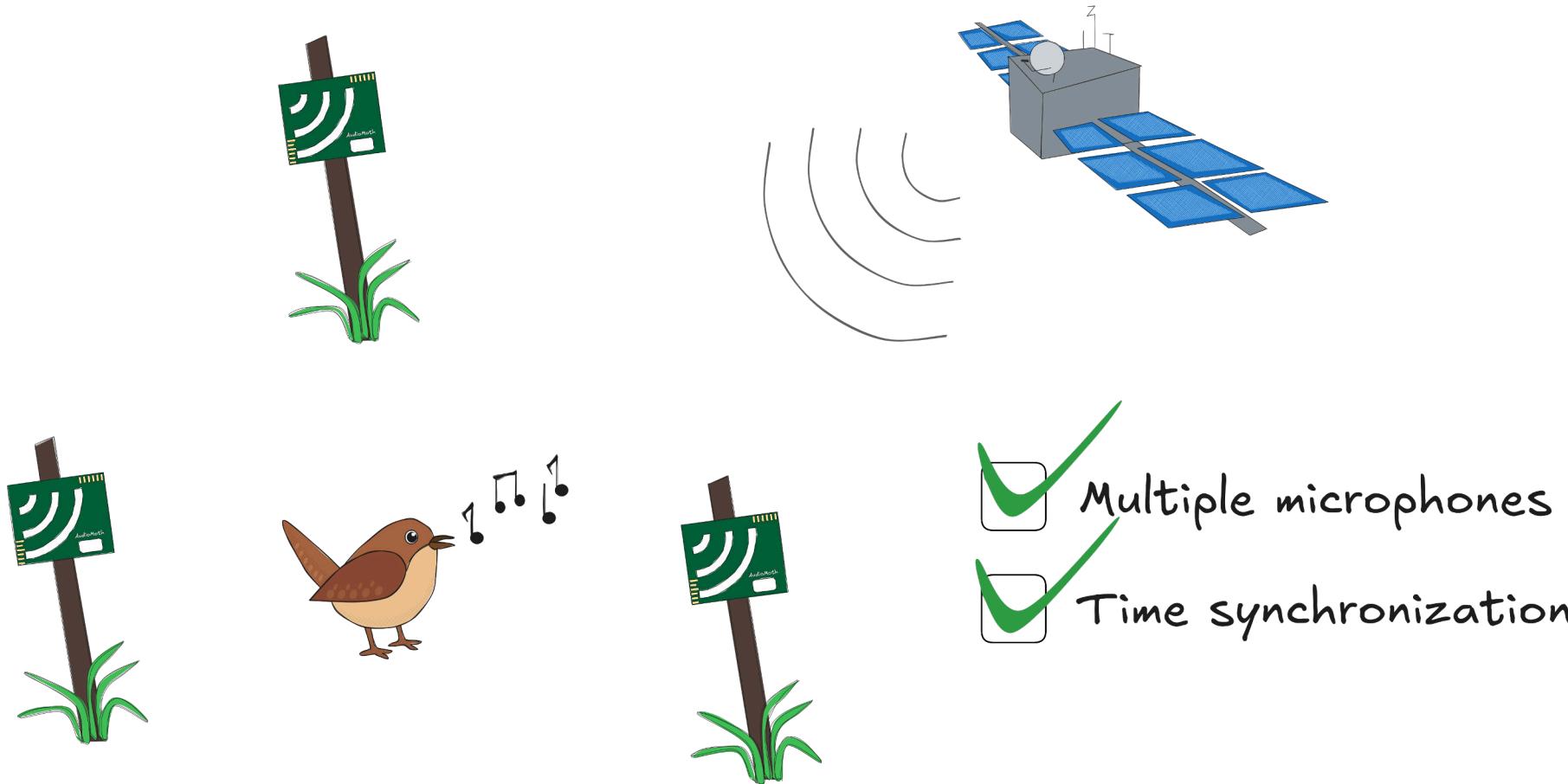
On the field



- Multiple microphones
- Time synchronization



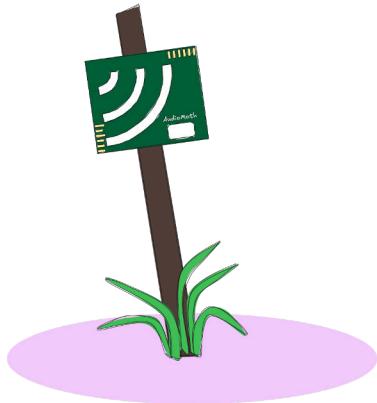
On the field



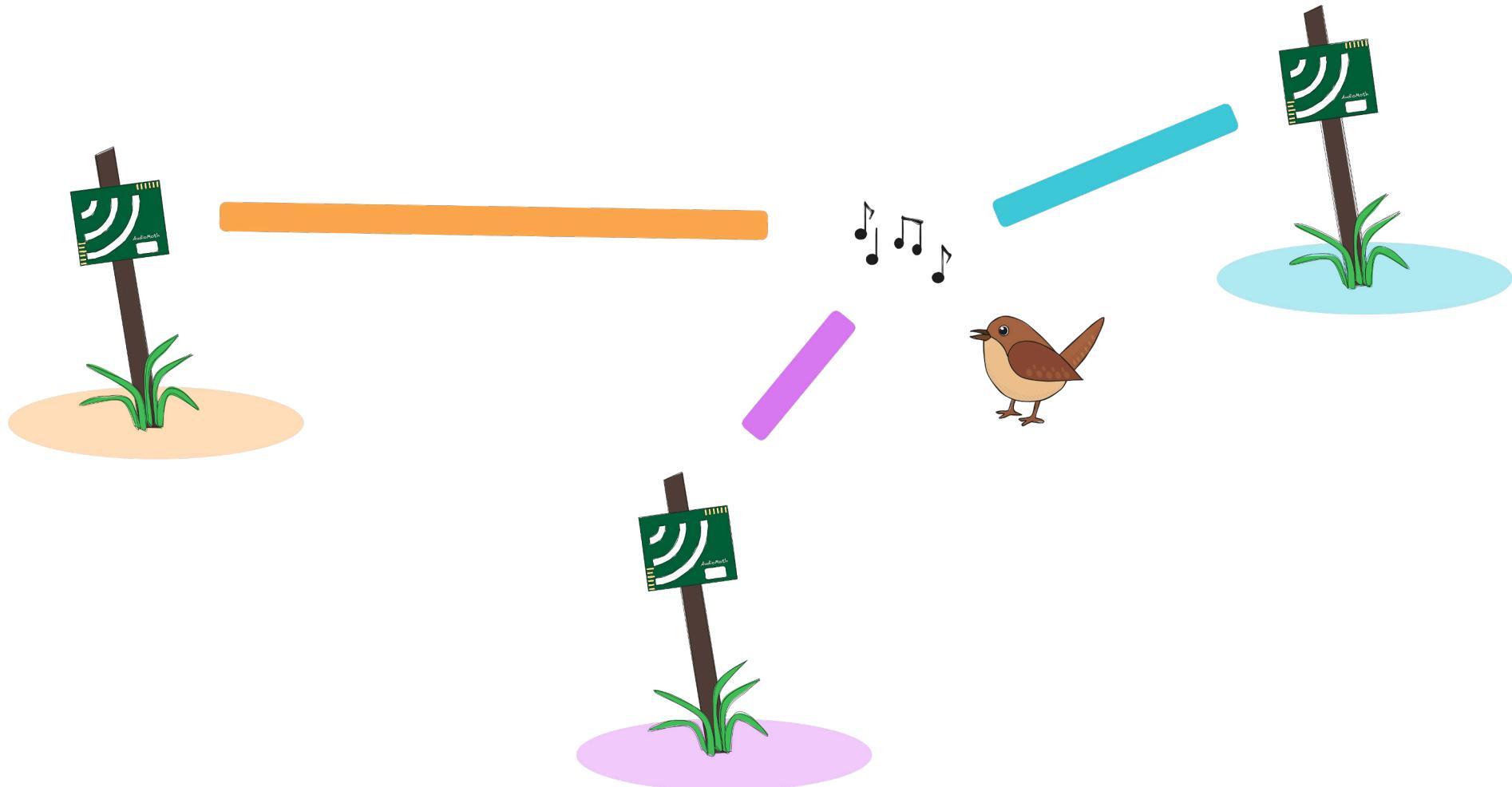
At the lab



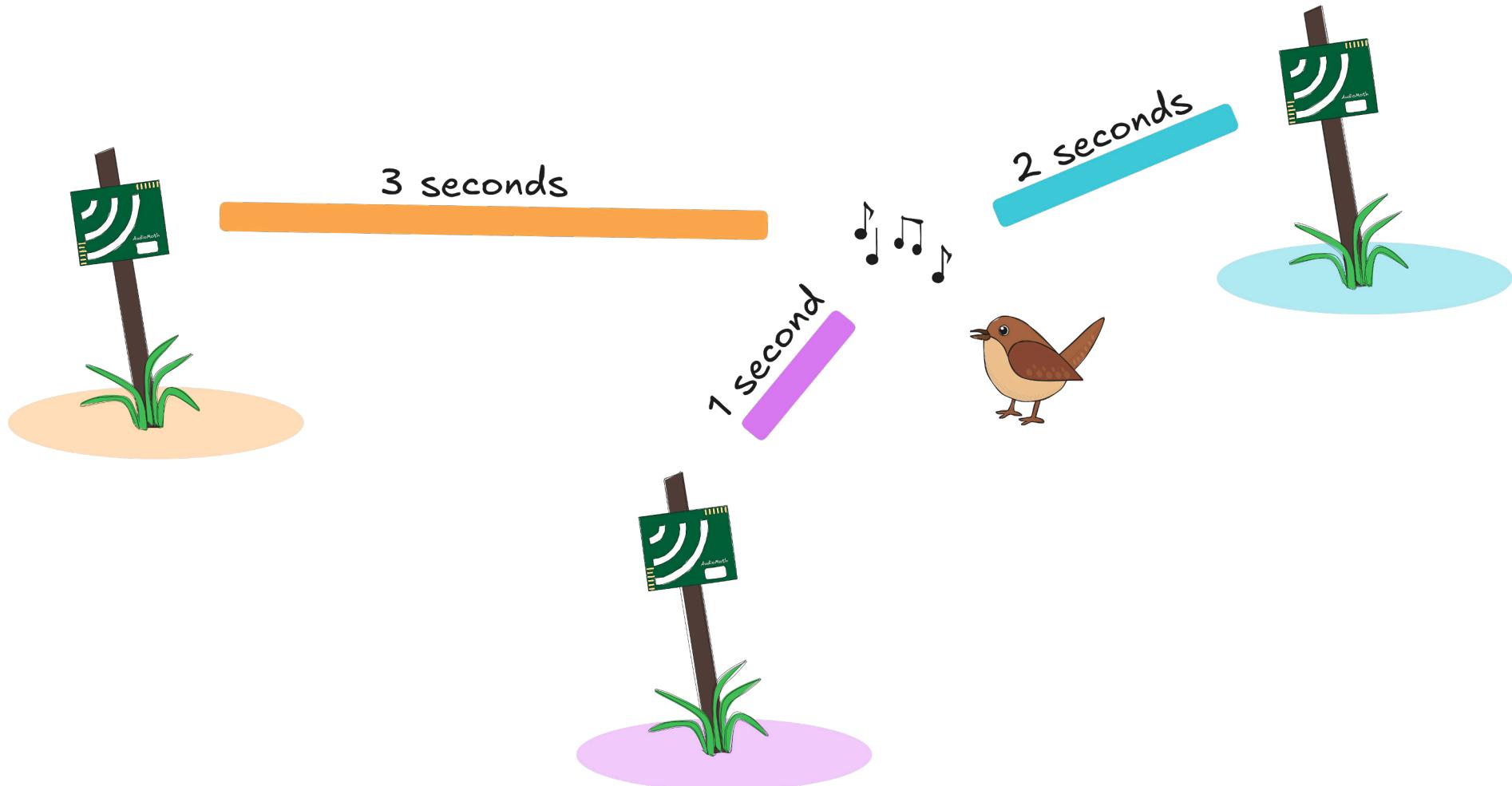
At the lab



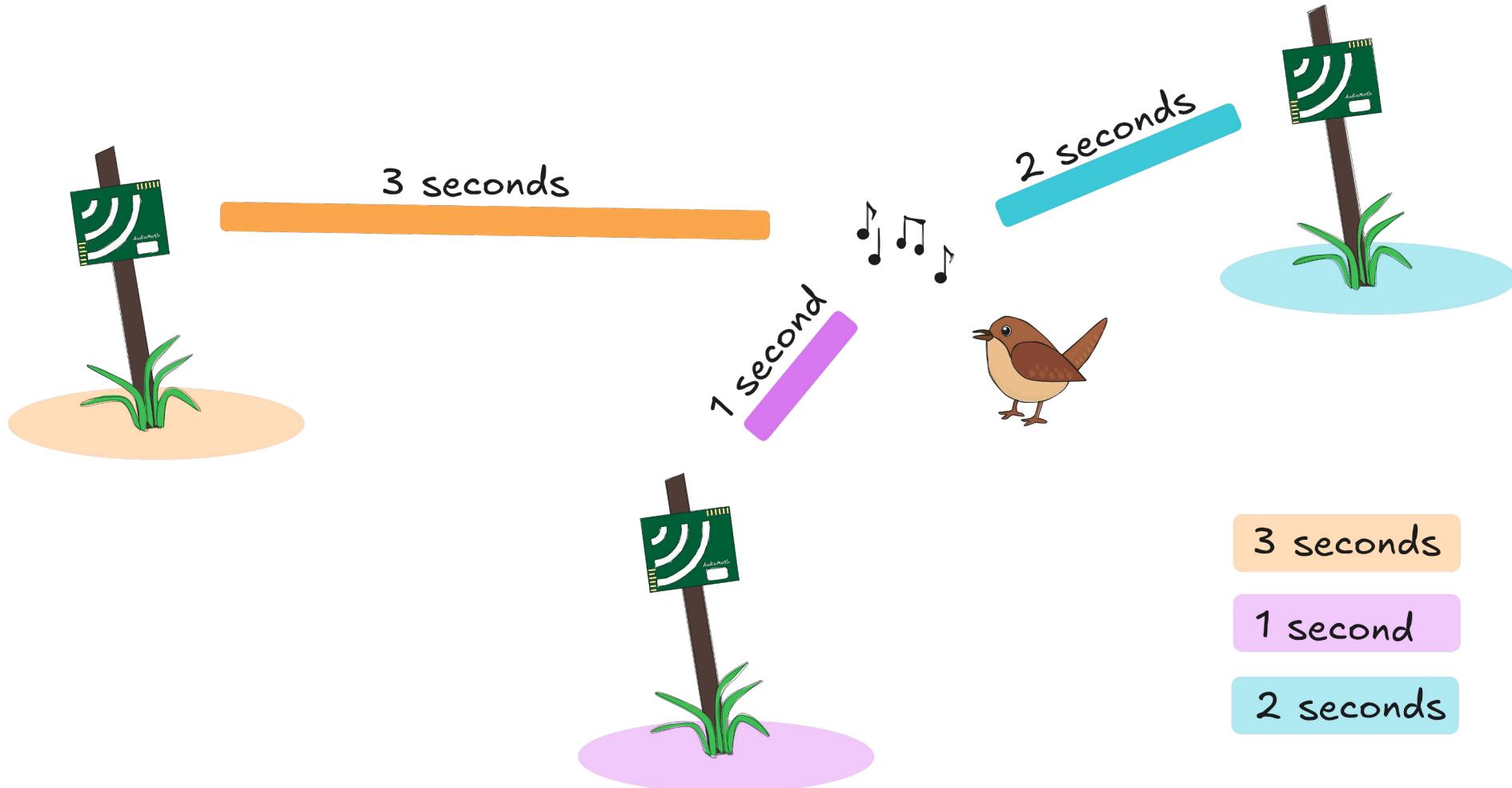
At the lab



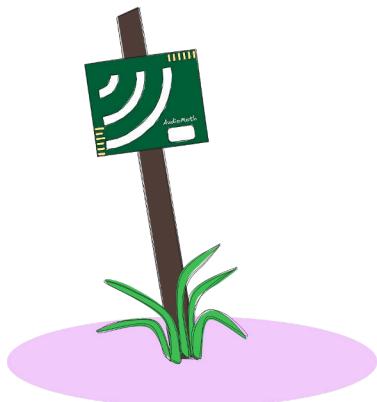
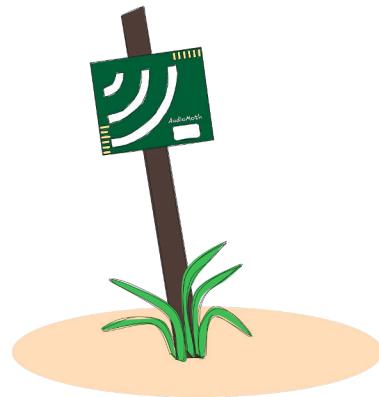
At the lab



At the lab



At the lab



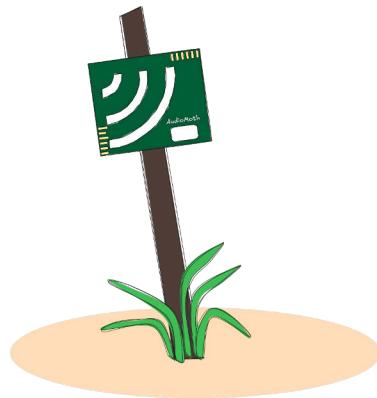
3 seconds

1 second

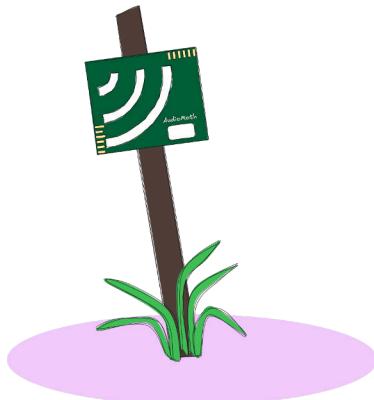
2 seconds



At the lab



?



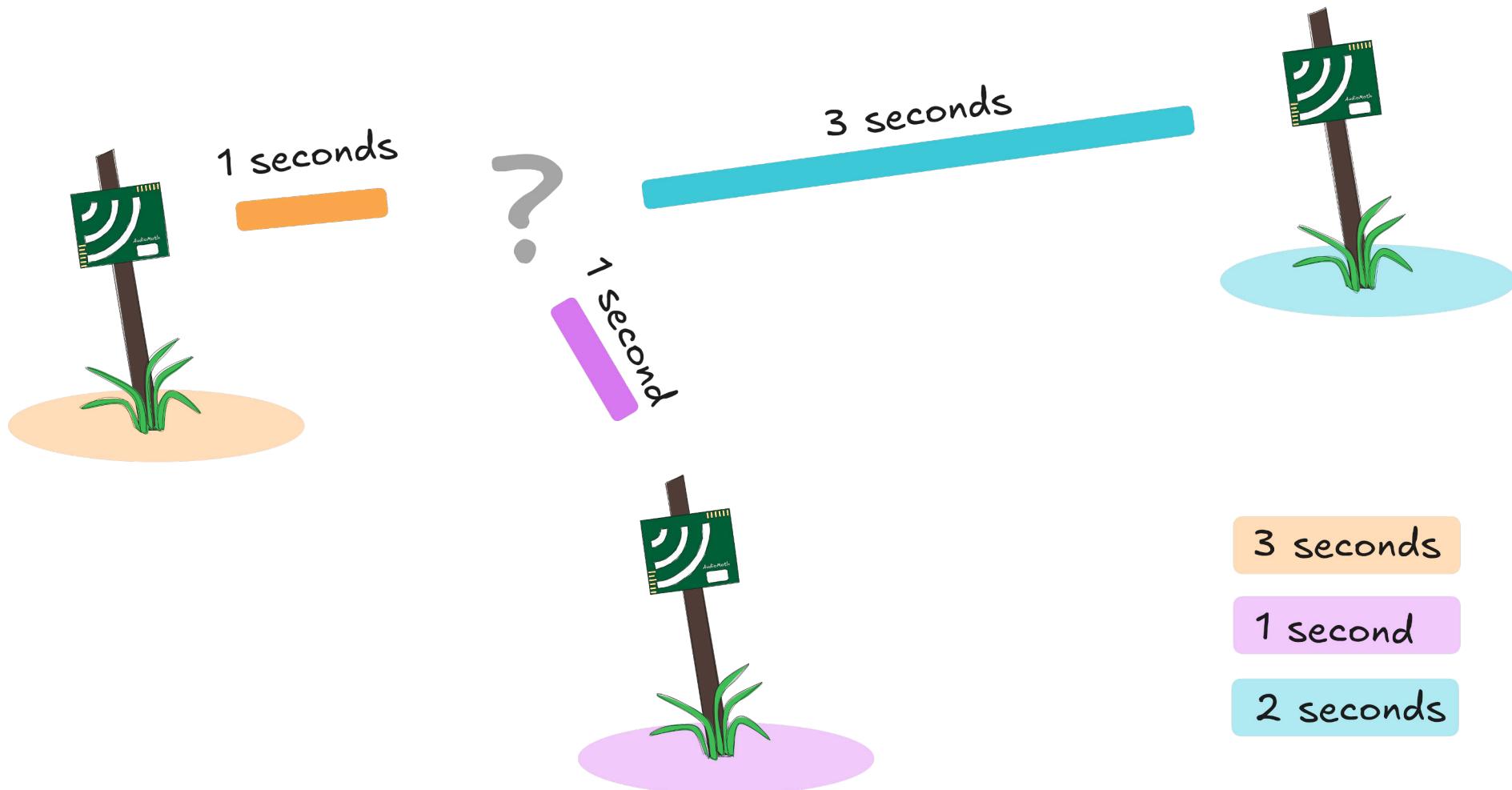
3 seconds

1 second

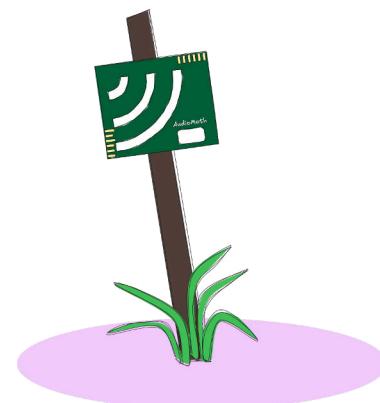
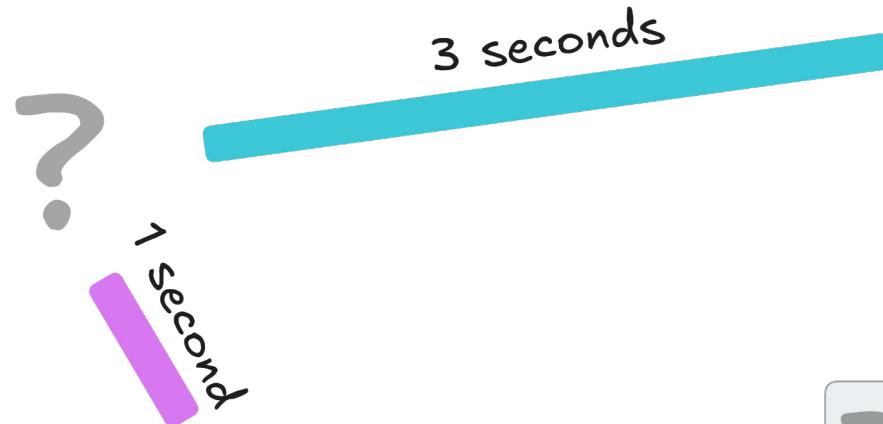
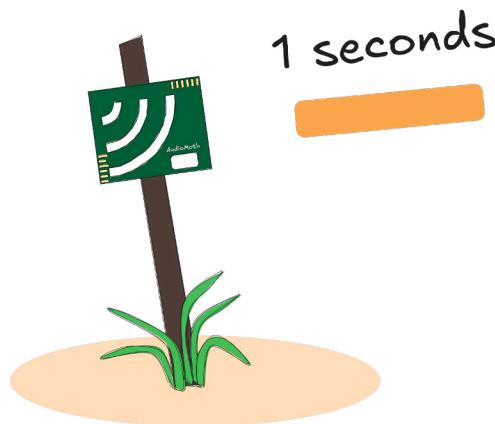
2 seconds



At the lab



At the lab



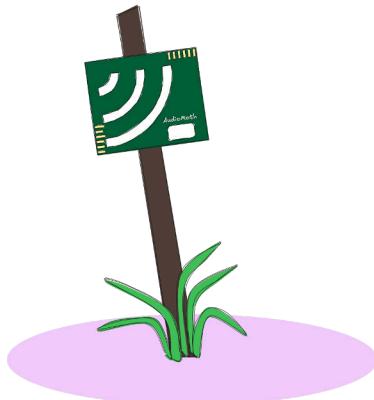
?	
1	3 seconds
1	1 second
3	2 seconds



At the lab



?



?

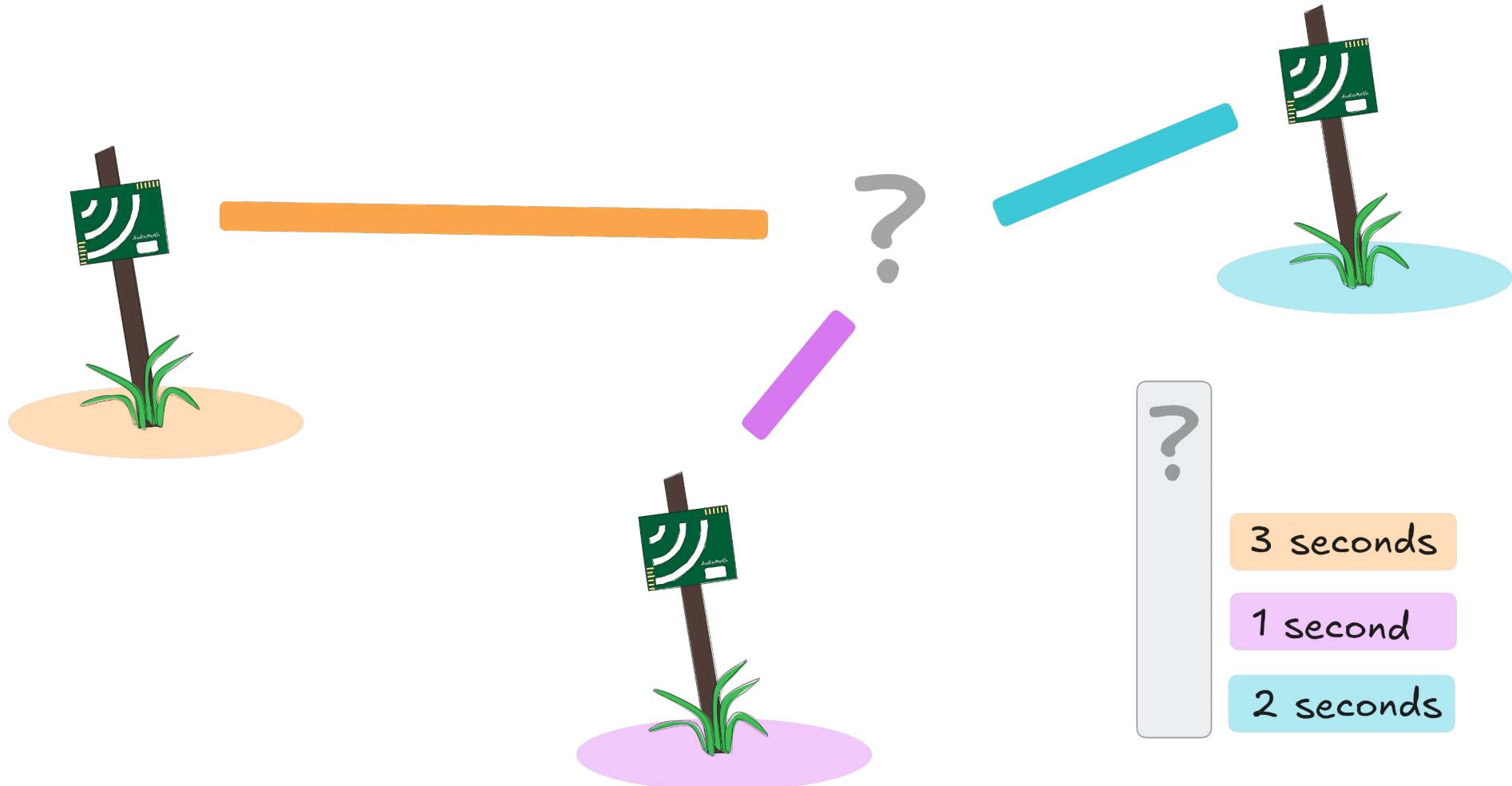
3 seconds

1 second

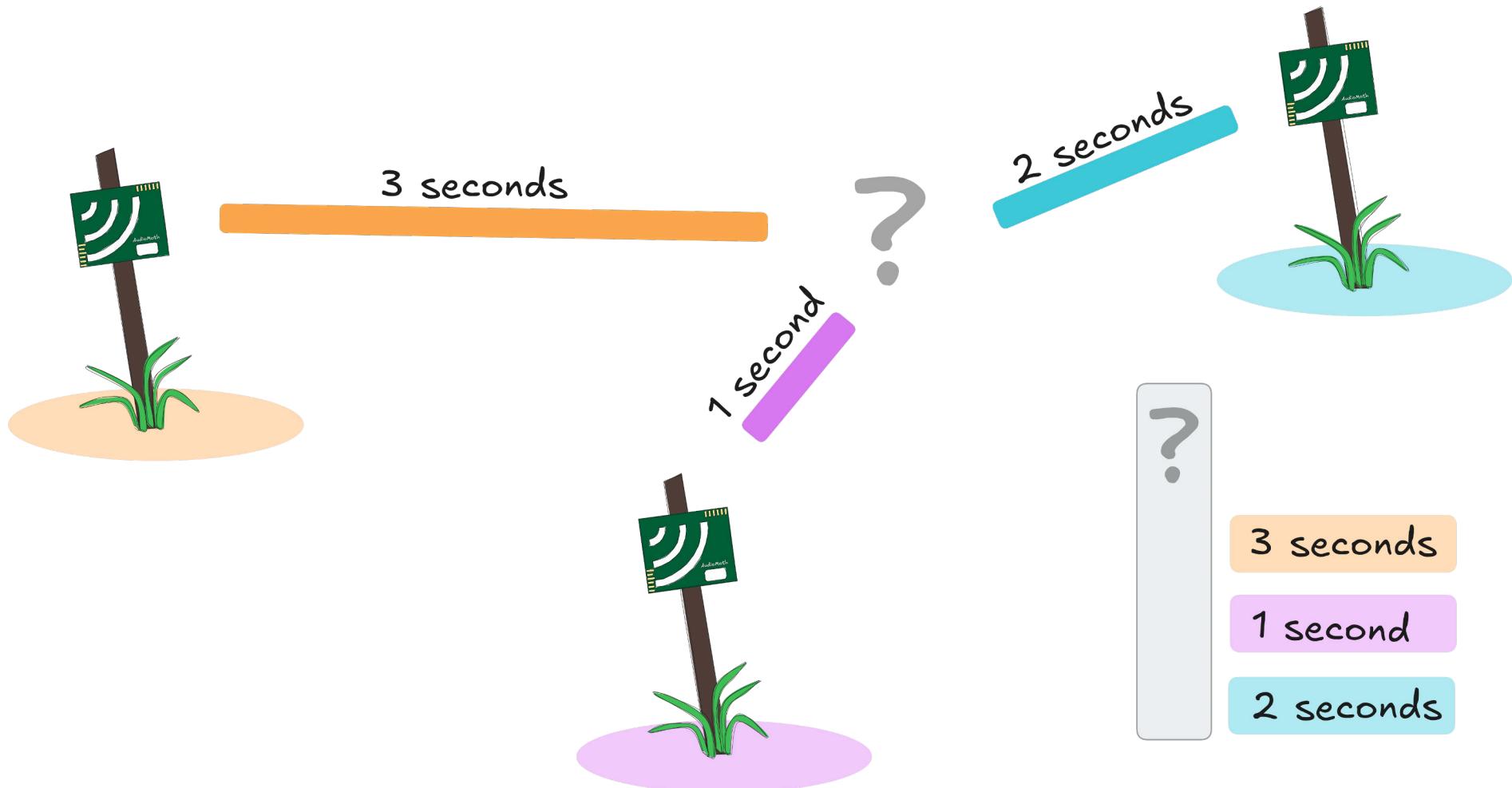
2 seconds



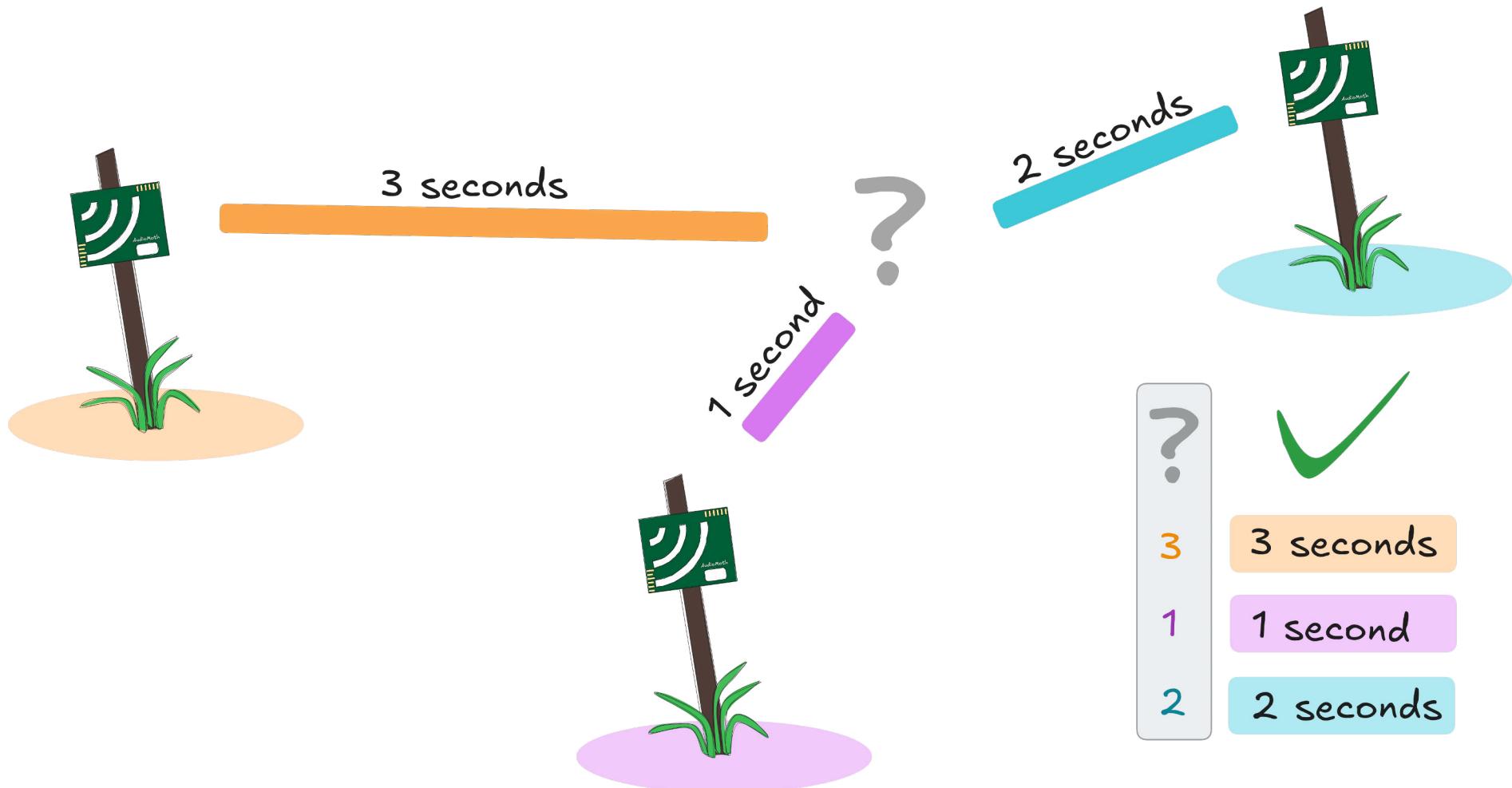
At the lab



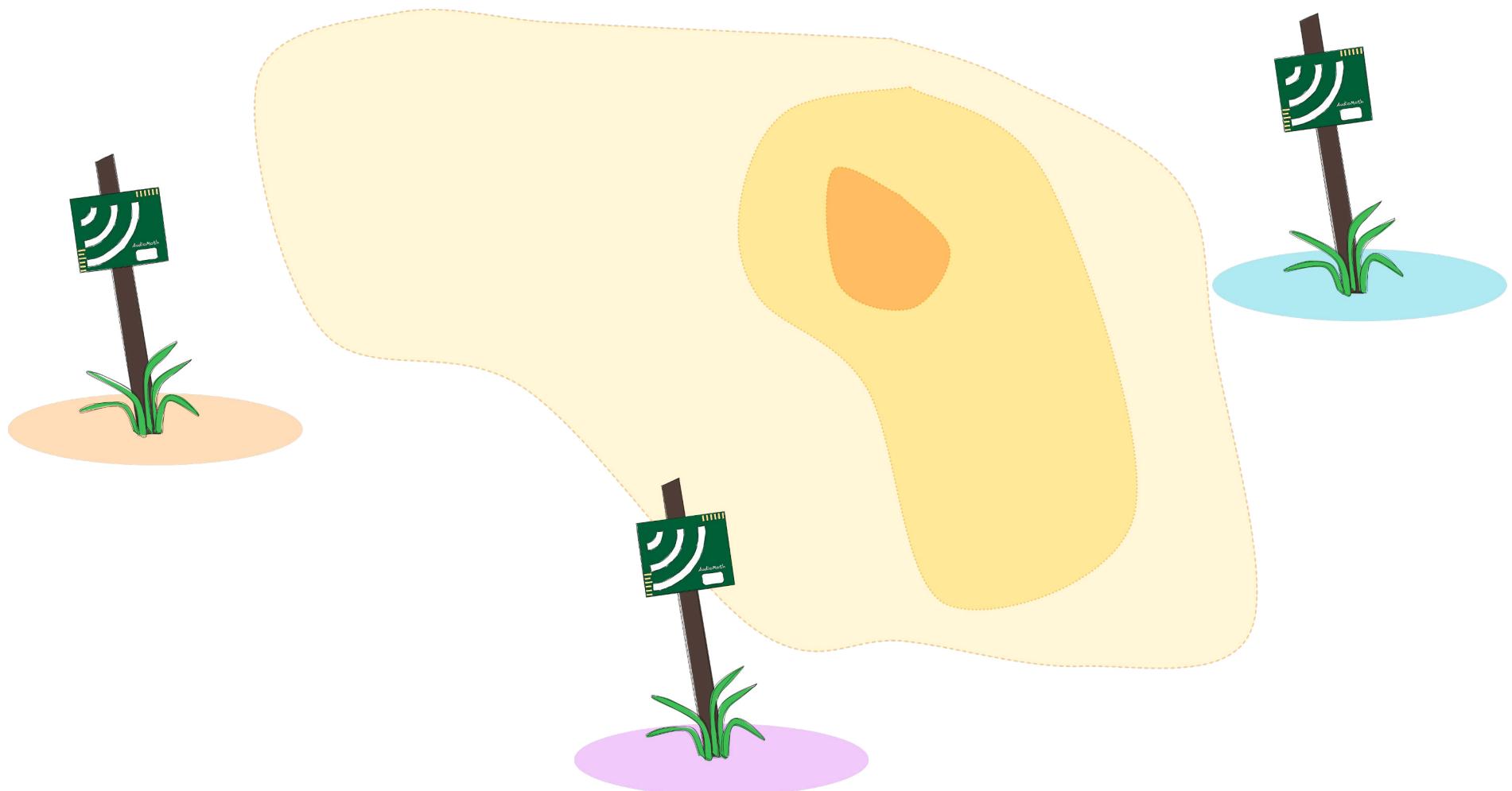
At the lab



At the lab



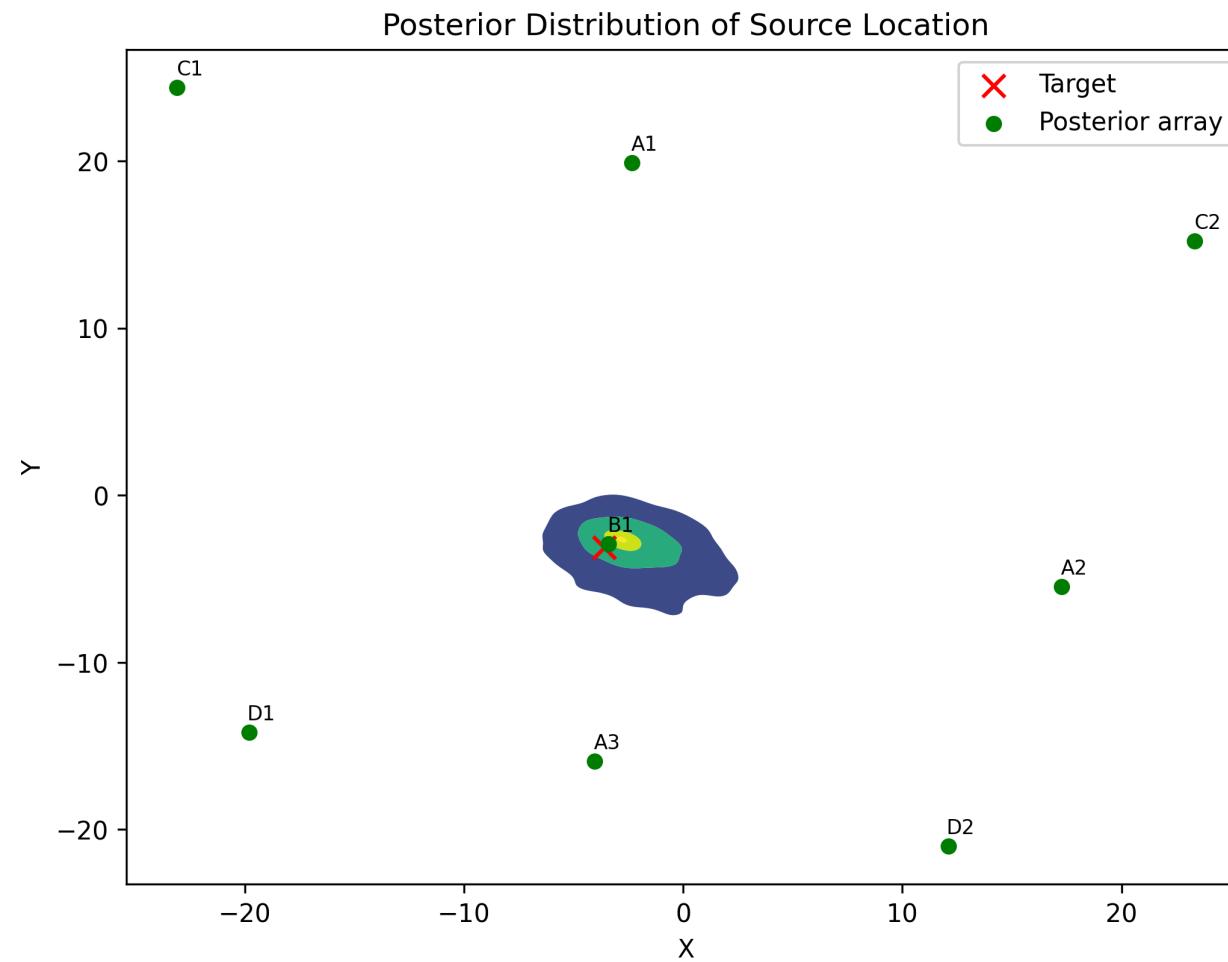
At the lab



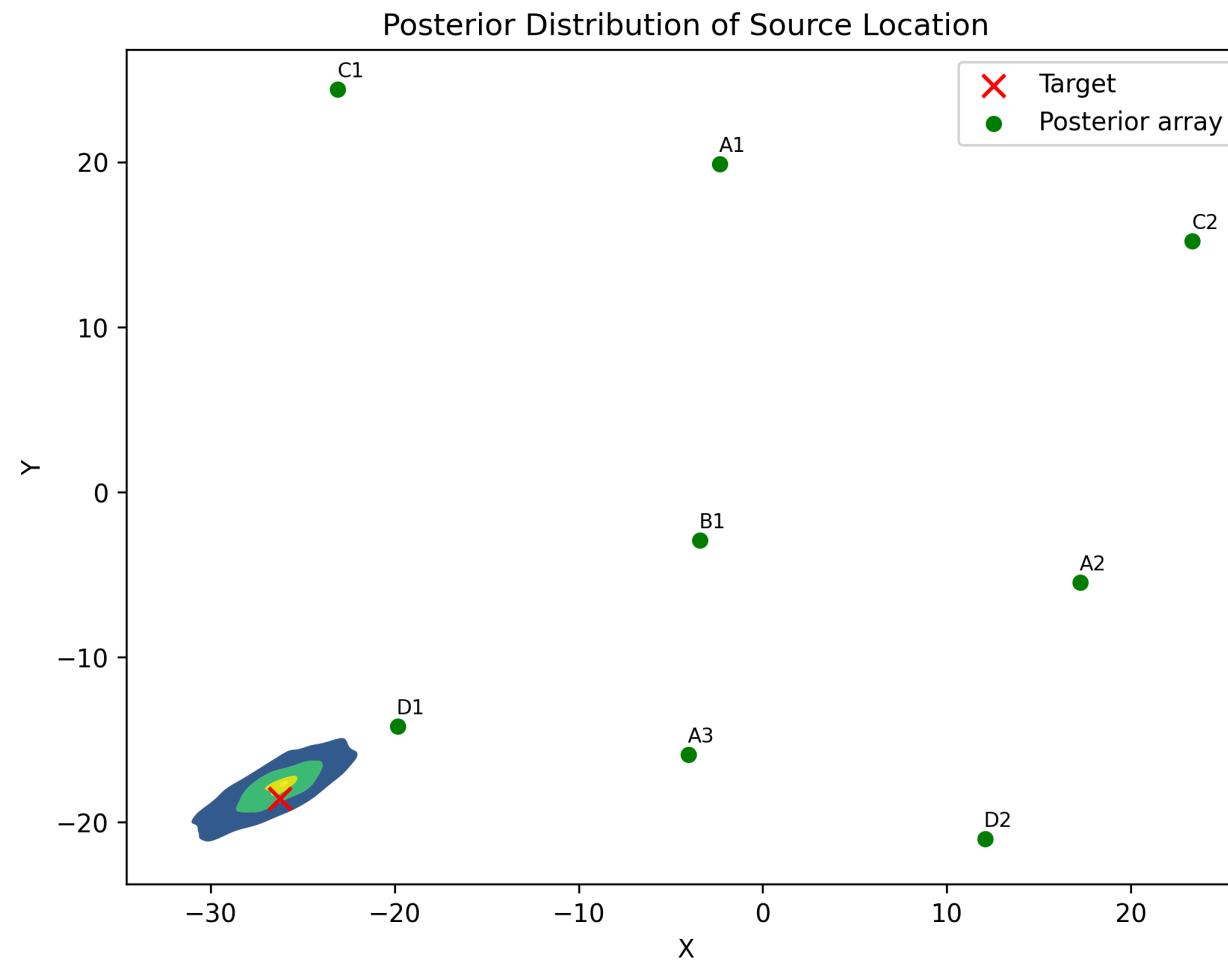
Sound source localization



Sound source localization



Sound source localization



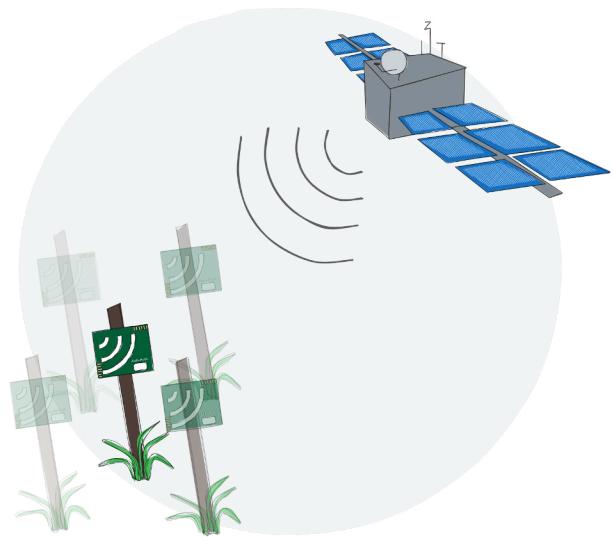
Localizing recorders



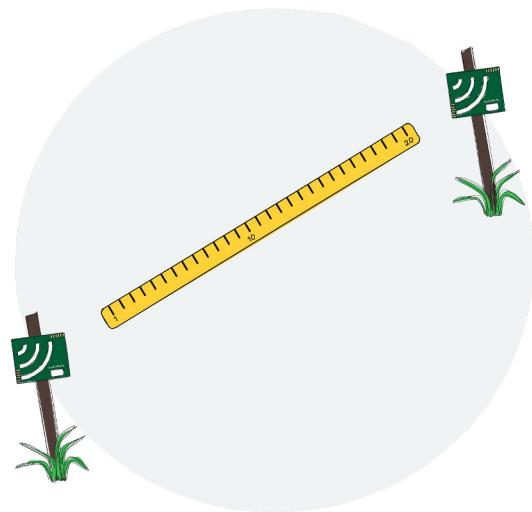
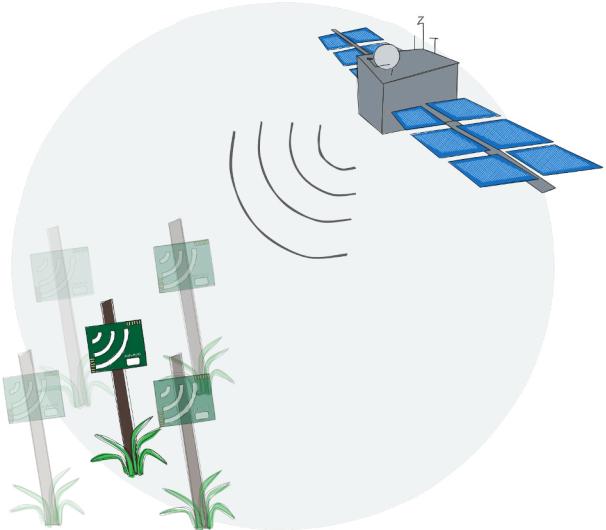
What we already know



What we already know



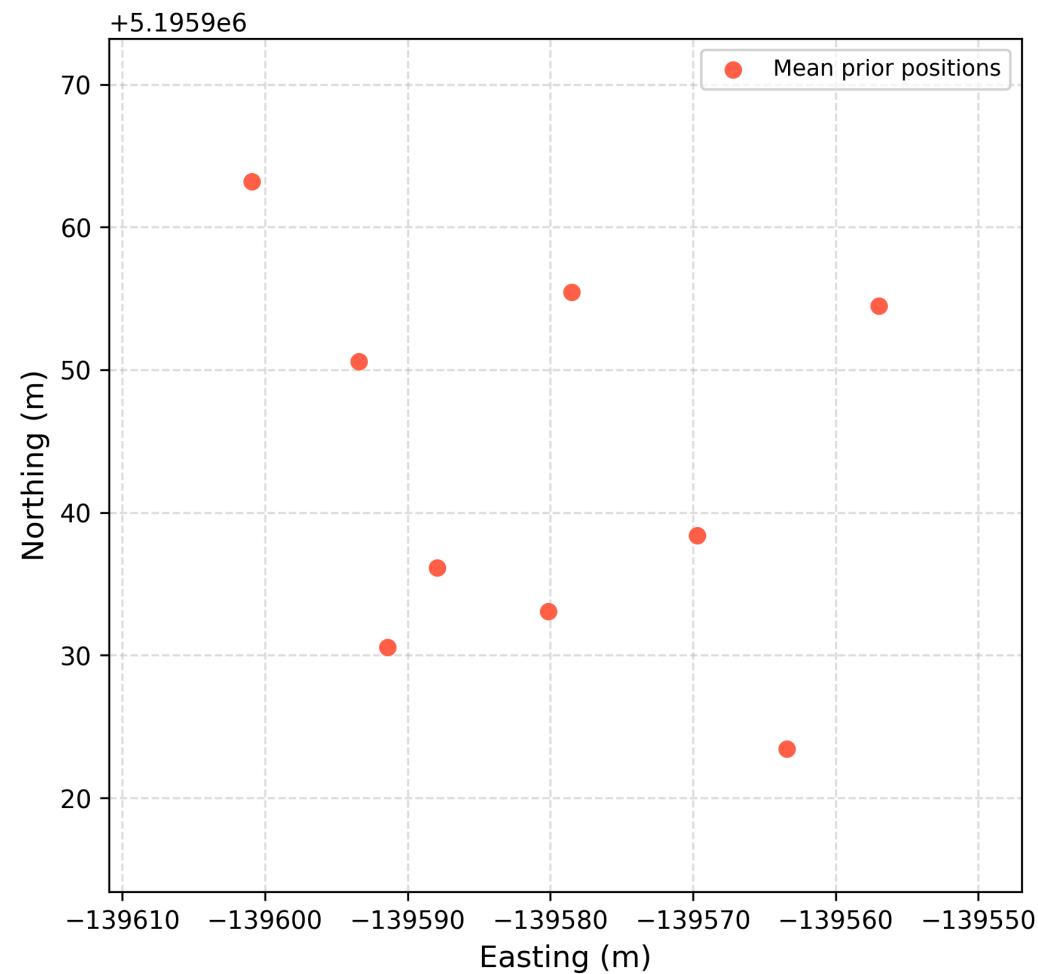
What we already know



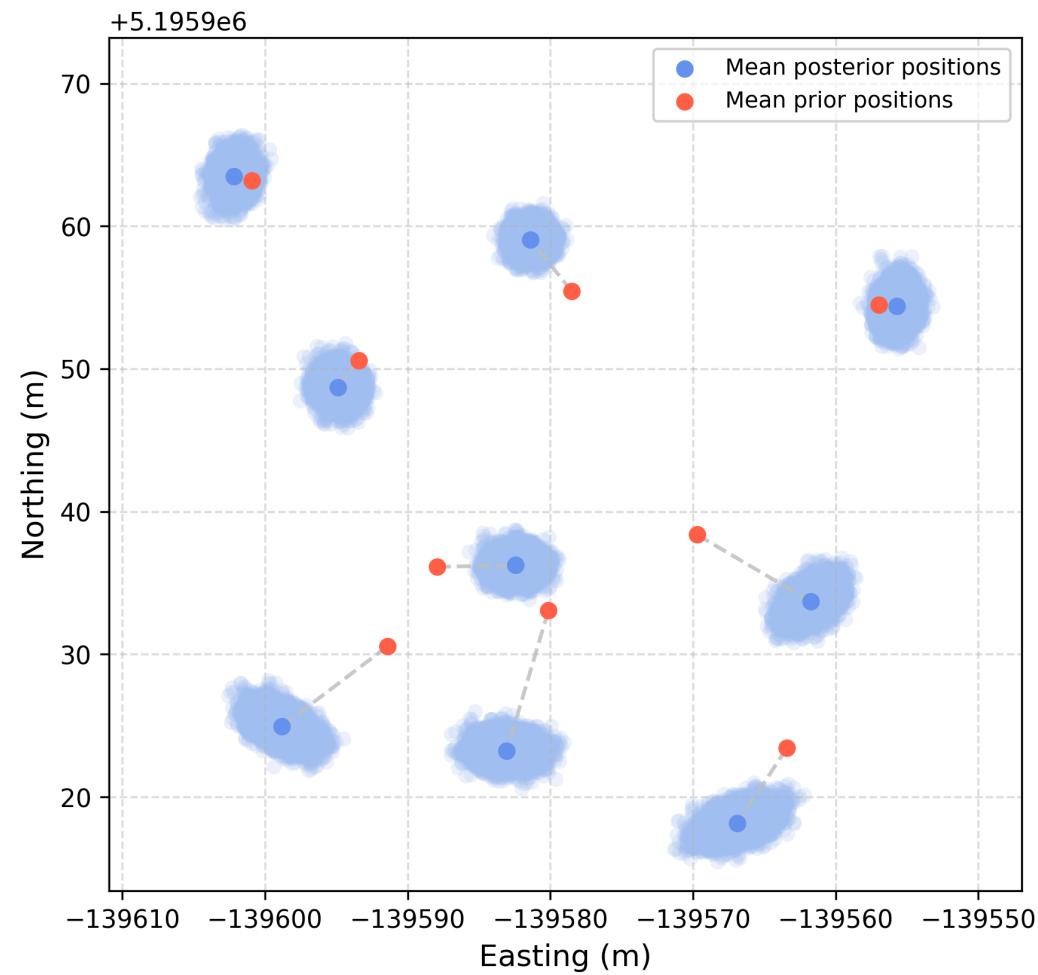
How we combine informations



How we combine informations



How we combine informations



Mapping behaviors



Linking sounds to landscape



References

- Dutilleux, Guillaume, Brett K Sandercock, and John Atle Kålås. 2023. “Chasing the Bird: 3D Acoustic Tracking of Aerial Flight Displays with a Minimal Planar Microphone Ar.” <https://doi.org/10.1080/09524622.2023.2241420>.
- Gibb, Rory, Ella Browning, Paul Glover-Kapfer, and Kate E. Jones. 2019. “Emerging Opportunities and Challenges for Passive Acoustics in Ecological Assessment and Monitoring.” <https://doi.org/10.1111/2041-210X.13101>.
- Mennill, Daniel J., John M. Burt, Kurt M. Fristrup, and Sandra L. Vehrencamp. 2006. “Accuracy of an Acoustic Location System for Monitoring the Position of Duetting Songbirds in Tropical Forest.” <https://doi.org/10.1121/1.2184988>.
- Rhinehart, Tessa A., Lauren M. Chronister, Trieste Devlin, and Justin Kitzes. 2020. “Acoustic Localization of Terrestrial Wildlife: Current Practices and Future Opportunities.” <https://doi.org/10.1002/ece3.6216>.
- Sugai, Larissa Sayuri Moreira, Thiago Sanna Freire Silva, Jr Ribeiro José Wagner, and Diego Llusia. 2019. “Terrestrial Passive Acoustic Monitoring: Review and Perspectives.” <https://doi.org/10.1093/biosci/biy147>.
- Teixeira, Daniella, Martine Maron, and Berndt J. van Rensburg. 2019. “Bioacoustic Monitoring of Animal Vocal Behavior for Conservation.” <https://doi.org/10.1111/csp2.72>.

