

How to organize a Hackathon for Animal Breeding?

INNOVATIVE AND OUT-OF-THE-BOX THINKING FOR A 360° PERSPECTIVE ON THE NEW BREEDING TECHNOLOGIES

Recent developments in omics technologies (such as genomics and transcriptomics) provide the research community with new tools to rethink breeding and to take advantage of improved knowledge of the relationship between the genome and phenome, such as epigenetics.

The GERONIMO project aims to provide pigs and chicken breeders with new and innovative selection methods that account for genome and epigenome information. Implementation and execution of new selection methods require 360° perspective on what new genomic technologies can bring, and it can benefit from innovative and out-of-the-box thinking. To facilitate this, a hackathon was organised to bring master's and PhD students from different backgrounds in Europe together to tackle this challenge.



Methods



To begin with, a group of project partners volunteered to form a working group in order to plan and organise the hackathon. This group decided to hold the event virtually, with two sessions with some time in between to work on the project. We thought this would help the participants to fully engage with each other and collaborate effectively. In the meantime,

communication materials were designed and promoted to invite students to join. A total of 17 participants registered after a 1-month communication campaign. They were divided into four groups by homogenising their academic and educational backgrounds between the groups.

The first session, held on April 6th 2022, served as a kick-off event. The main idea behind the hackathon was presented, a roleplaying game was conducted, and an ideation session was organized to help the groups get started on their projects. The second and final session was held on May 14th, 2022, when each group had to submit a short project report on their project. In this second session, the project groups presented their projects, which were evaluated by a selected expert jury composed of Franck Meijboom (Utrecht University), Guillaume Devailly (INRAE), Barbara Harlizius (Topigs Norsvin), and Anne-Marie Neeteson (Aviagen). The assessment criteria included the depth of thinking, the level of innovation and creativity of both the issue and the solution, and the social acceptability of the idea.



RESULTS



Among the four participating groups, three successfully submitted the required reports.

The winning project proposal was centred on a multi-omics approach to selective breeding for heat tolerance in pigs. It proposed a comparative study of different pig genetic groups exposed to heat stress with a control group raised at average temperature using omics technologies. The aim was to identify specific genes and biological pathways involved in predicting heat tolerance.



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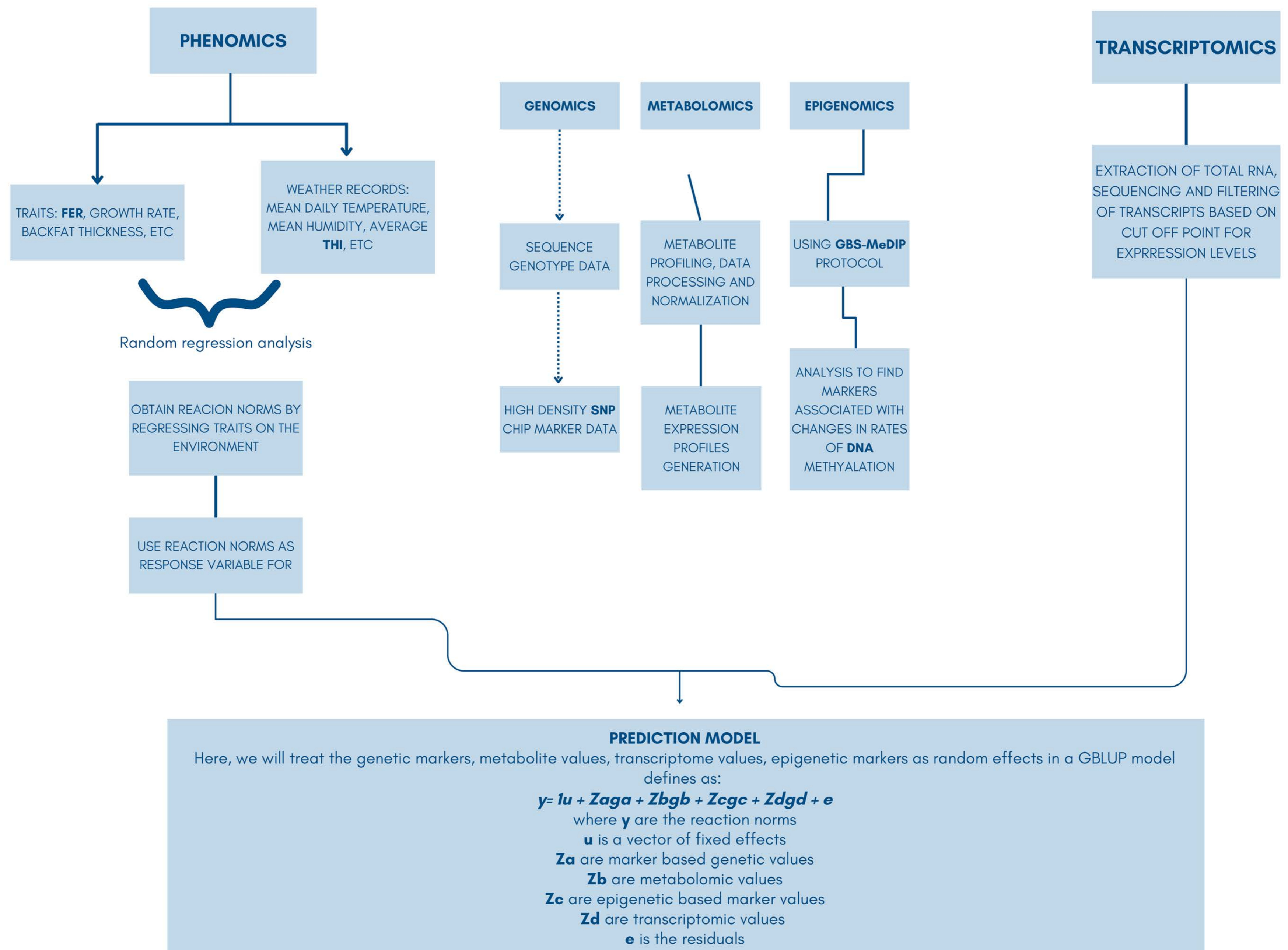


Fig. 1: Overview of the pipeline suggested by the winning group

PRACTICAL RECOMMENDATIONS

Organizing the Hackaton has not only enriched us with new insights, ideas and suggestions for implementing such an event, but is also highlighted the importance of some key considerations:

- ✔ Organising online sessions may decrease the participants' engagement level, as it is easier to refrain from participating actively. Organising in-person activities can alleviate this.
- ✔ Playing interactive online games can enhance interaction and facilitate participant engagement. In particular, role-playing games can broaden perspectives on the topic and inspire further thought.
- ✔ The promotional activities should include active collaboration and potential ambassadorship from European universities. Their support is much needed to communicate about the event and reach many applicants and participants.
- ✔ Applicants should be allowed to form or enter the hackathon with their group. Recommendations can be made about the group's formation, and it is up to the applicants to follow guidelines. Allowing the participants to form their groups would improve the ability to work together and increase the likelihood of completing the challenge.
- ✔ Providing limited information on the challenges and potentials leaves more room for creativity in analysing and addressing the main problem. By providing only need-to-know information, the participants will be forced to work on creative ideas stemming from their imagination, promoting out-of-the-box thinking.

CONCLUSION

In conclusion, organising a hackathon can offer valuable insights into complex challenges like utilising genomic technologies in animal breeding. The event should be organised in person, with the support of the universities, in promotional activities to attract more participants. Allowing participants to form groups and providing limited information can promote collaboration and creativity. The hackathon organised by the GErONIMO project successfully brought together students with different backgrounds to work on the innovative use of genomic technologies.

