Challenge 3: Accurate inference of airway mechanics from impulse oscillometry data

Background: Arete have developed a respiratory medical device, "The Respicorder" (http://www.aretemedtech.com/) that combines several measurements of lung function into one portable device. One of these measurements uses impulse oscillometry (IOS), whereby a small puff of air is quickly oscillated into and out of the mouth during normal breathing. The resulting pressure and flow rate changes can be used to the impedance of the airways, which in turn can provide proxy measurements for (patho)physiological changes in the small airways.

The problem: Disentangling the signal so that airway mechanics can be measured accurately (and device properties/environmental effects can be accounted for) remains an open challenge that has the potential to significantly improve the device and its translation to clinic.

Data available: Participants will have temporary access to IOS measurements collected by Arete for the purposes of this workshop

Relevant expertise: This challenge will likely require a combination of expertise in working with medical data, spectral analysis, as well as aspects of fluid/solid mechanics and airway physiology.