Abstract: Originally purposed to streamline documentation of care, electronic health records (EHRs) provide a massive amount of diverse and readily available data that can be used to tackle important healthcare problems. Clinical phenotyping is one of them, which refers to identifying patient subgroups sharing common clinically-meaningful characteristics. However, there are significant challenges in using EHR data to computationally tackle this problem, related to algorithmic scalability, model interpretability and the longitudinal nature of patient data. In this talk, recent developments in the area of tensor factorization will be presented which effectively tackle those challenges.