BDI Training Session Form

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| Your name  *Title, First Name, Last Name* | Dr. Adriana Tomic |
| Your affiliation  *Department* | Systems Immunology, Department of Paediatrics |
| Provisional title of the training session | SIMON: open-source software for application of machine learning to biomedical data |
| Provisional description | In this course, I will present how to use SIMON – our recently developed open-source software for the application of machine learning to biological and clinical data. In SIMON, analysis is performed using an intuitive graphical user interface and standardized, automated machine learning approach allowing non-technical researchers to identify patterns and extract knowledge from high-dimensional data and build thousands of high-quality predictive models using 180+ machine learning algorithms. With an easy-to-use graphical user interface, standardized pipelines, and automated approach for machine learning and other statistical analysis methods, SIMON helps to identify optimal algorithms and provides a resource that empowers non-technical and technical researchers to identify crucial patterns in biomedical data.  **If you plan to use machine learning to identify patterns in your data and want to learn more about SIMON and how to use it, you are all invited to join this BDI Training Session.** |
| Topics to be covered | -Data preparation and integration  -Overfitting and how to avoid it  -Feature processing methods to avoid ‘curse of dimensionality’  - How to deal with missing data using in-built multi-set interaction algorithm  -Performing machine learning (using also automated ML option)  - Performance metrics, evaluation and selection of high-quality models  -Feature selection: scoring and elimination  - Exploratory analysis |
| Learning objectives | - complete end-to-end machine learning analysis using SIMON  - learn how to prepare data for analysis  - understand the importance of reducing the dimensionality using appropriate methods  - select appropriate machine learning algorithms  - learn how to properly evaluate predictive models using performance metrics  - select the most important features  - perform exploratory analysis |
| Prior knowledge required  *What skills and/or knowledge should participants already have?* | No prior knowledge required |
| Intended audience  *Do you have a specific audience in mind?* | Biomedical researchers who want to learn how to apply machine learning using SIMON |
| Audience requirements  *What will the participants need to bring with them, if anything? For example, is the session BYOD (Bring your down device) friendly?* | BYOD |
| Pre-course work  *We encourage participants to engage with the session before attending. What, if any, activities will you want participants to do ahead of time?* | SIMON installation |
| Type of session  *How will this session be delivered? For example, a mix of presentation and practical, a workshop etc. All sessions should contain a hands-on element (exercises to be completed by participants before the session, during the session or in their own time after the session)* | Short presentation, followed by practical, hands-on SIMON demo session using provided biomedical dataset |
| Preferred class size | 20-30 participants |
| Length and number of sessions | 1h, 2 sessions |
| Software required | Docker (version 17.05 or later is required)  SIMON latest version () |
| Operating systems | Any |
| Any other relevant information? | / |