**NeuroMiner changes for NM 1.2 (Feanor) Release**

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| **(New) NM functionalities** | **New/Udated function(s)** | **Status** | **Responsible** |
| (Re-)implementation of constrained stratified CV | nk\_CVpartition\_config, nk\_MakeCrossFolds, nk\_CVpartition | Done | Nikos |
| Alternative label definition interface and functionality |  | Done | Clara |
| Factorization visualization in the NM visualization module | nk\_VisModels, nk\_VisXWeight, nk\_VisXHelper, nk\_PrintResults2, display\_visual | Not implementable | Nikos |
| Factorization mode for NM MLI module (identify e.g. eigenvariates and manipulate only voxels within eigenvariates (strategy for feature assignment to factors will be needed => maximum-wins method) | nk\_MLI\_config, nk\_MLInterpreter | Not implementable | Nikos/Ariane |
| Synthetic data generation module | *New Functions* | Done | Nikos/Clara |
| Optimized preprocessing params and model export | *New Functions* | Done | Clara |
| Improved memory management (e.g. in the visualization module) | nk\_VisModelsPrep, nk\_VisModels | In Progress | Ariane/Clara |
| Pruning of unused/orphaned functions |  | Not started | Clara |
| Debugging of multi-class permutation | nk\_VisModels, nk\_VisXPermHelper | Done | Nikos |
| Hyperopt optimization (see Matlab package hyperopt) and hyperparameter optimization using swarm optimization techniques (PSO, GA, Simulated Annealing) | *New Functions*, nk\_MLOptimizer\_ParamAnnealer | Not started | tbd |
| MLI shapley values function | nk\_MLInterpeter | In Progress | Ariane |
| Fully implement surface-based image processing stream | DataIO, nk\_PerfSpatFilt | Not started | Nikos |
| Implement adaptive reslicing of voxel- and surface-based data (like smoothing) | nk\_PerfSpatFilt, resample\_image | Not started | Nikos |
| “Skip-CV1 cycle and train on full CV1 training and test data” menu item should not be shown in menu when multiple preprocessing hyperparams are present. | nk\_RFE\_config | Not started | Ariane |
| Plug-in interface for the preprocessing module | *New Functions* |  | Clara |
| Refactoring of hyperparameter configuration based on matlearn configuration methodology | nk\_Grid\_config | Not started | Nikos |
| Command line interface for NM | *New Functions* | Not started | Clara |
| Porting of NM Results Viewer to app designer | *New Functions* | Not started | Clara/Ariane |
| Implement model significance testing in the model application module | nk\_OOCV, nk\_OOCVprep | Done | Nikos |
| Implement multiple OOCV container processing in model application module | nk\_OOCV | Done | Nikos |
| Extending LIBLINEAR configurator to include bias term, regularization of bias and auto-hyperparameter optimization options | nk\_LIBLIN\_config, nk\_GetParam2\_LIBLIN | Done | Nikos |
| Extending the NM application module to include subgroup computation and displays of performance metrics in OOCV data | nk\_OOCV, nk\_OOCVPrep | Done | Nikos |
| Improving the OOCV module to not smooth at the CV2 level because this leads to repeated smoothing of the input data. Instead, smooth data with all smoothing kernels needed before entering the CV2 loop | nk\_OOCV, nk\_PerfInitSpatial, nk\_PerfPreprocessSpatial | Done | Nikos |
| Improving the OOCV module to perform decision score aggregation in the same way as in the training/CV module | nk\_OOCV | Done | Nikos |
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***NeuroMiner 1.1 New Feature List***

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| **NM functionalities requiring update** | **Function** | **Status** |
| *Implement mixed-mode stacking option to allow mixing of original data and higher-level predictions in meta-learning setup.* | *Will not be included in NM 1.0* | *Not started* |
| *Implement hierarchical stacking / data fusion in NM* | *Will not be included in NM 1.0* | *Not started* |
| *Implement Bayesian optimization methods for large parameter spaces* | *Will not be included in NM 1.0* | *Not started* |