Initialise The COBRA Toolbox

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Reviewers:

MATERIALS - EQUIPMENT SETUP

Please ensure that all the required dependencies (e.g. , git and curl) of The COBRA Toolbox have been properly installed by following the installation guide here.

PROCEDURE

At the start of each MATLAB session, The COBRA Toolbox should be initialised. Navigate to the directory where you installed The COBRA Toolbox and initialise, but without updating it.

```
updateToolbox=0;
initCobraToolbox(updateToolbox) % false, as we don't want to update
                                                   COnstraint-Based Reconstruction and Analysis
            The COBRA Toolbox - 2019
                     _ { |
            \ \
            | |_| | | | |_| | |
                                   Documentation:
                                                   http://opencobra.github.io/cobratoolbox
> Checking if git is installed ... Done (version: 2.17.2).
> Checking if the repository is tracked using git ... Done.
> Checking if curl is installed ... Done.
> Checking if remote can be reached ... Done.
> Initializing and updating submodules (this may take a while)... Done.
> Adding all the files of The COBRA Toolbox ... Done.
> Define CB map output... set to svg.
> TranslateSBML is installed and working properly.
> Configuring solver environment variables ...
  - [----] ILOG CPLEX PATH: --> set this path manually after installing the solver ( see instructions )
  - [---*] GUROBI PATH: /Library/gurobi800/mac64/matlab
  - [---] TOMLAB PATH: --> set this path manually after installing the solver ( see instructions )
  - [---] MOSEK PATH: --> set this path manually after installing the solver ( see instructions )
  Done.
> Checking available solvers and solver interfaces ... Done.
> Setting default solvers ... Done.
> Saving the MATLAB path ... Done.
  - The MATLAB path was saved in the default location.
```

>	Summary	of	available	solvers	and	solver	interfaces
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Support	LP MILP	QP	MIQP	NLP			
gurobi	active		1	1	1	1	_
ibm_cplex	active	0	0	0	0	_	
tomlab_cplex	active		0	0	0	0	_
glpk	active		1	1	_	_	_
mosek	active		0	_	0	_	_
matlab	active	1	-	-	-	1	
cplex_direct	active		0	0	0	-	_
dqqMinos	active		1	_	_	_	_
pdco	active		1	-	1	-	_

```
quadMinos active
qpng
            passive
tomlab_snopt passive
                                                          \cap
                               1
lp solve legacy
Total
                               7
                                      2
                                             3
                                                  1
                                                        1
+ Legend: - = not applicable, 0 = solver not compatible or not installed, 1 = solver installed.
> You can solve LP problems using: 'glpk' - 'pdco'
> You can solve MILP problems using: 'glpk'
> You can solve QP problems using: 'pdco' - 'qpng'
> You can solve MIQP problems using:
> You can solve NLP problems using:
> Checking for available updates ... skipped
```

The user who primarily uses the official openCOBRA repository may automatically initialise The COBRA Toolbox. To do so, edit the MATLAB startup.m file and add a line with initCobraToolbox so that The COBRA Toolbox is initialised each time that MATLAB is started.

```
if usejava('desktop') && 0 % This line of code is to avoid execution in non gui-environment
   edit startup.m
end
```

ANTICIPATED RESULTS

The initialisation step automatically checks the configuration of all of the required and some of the optional software dependencies. During initialisation, all git submodules are udpated. The solver paths are set when available and compatible. A system-dependent table with the solver status is returned, together with solver suggestions. The user is also presented with options to update The COBRA Toolbox when necessary.

CRITICAL STEP

During initialisation, a check for software dependencies is made and reported to the command window. It is not necessary that all possible dependencies are satisfied before beginning to use the toolbox, e.g., satisfaction of a dependency on a multi-scale linear optimisation solver is not necessary for modelling with a mono-scale metabolic model. However, other software dependencies are essential to be satisfied, e.g., dependency on a linear optimisation solver must be satisfied for any method that uses flux balance analysis.

TROUBLESHOOTING

- 1. Read the output of the initialisation script in the command window. Any warning or error messages, though often brief, will often point toward the source of the problem during initialisation if read literally.
- 2. Verify that all software versions are supported and have been correctly installed.
- 3. Ensure that you are using the latest version of The COBRA Toolbox by typing updateCobraToolbox
- 4. Verify and test The COBRA Toolbox, as described in the "Verify and test The COBRA Toolbox" tutorial.
- 5. Finally, if nothing else works, consult the COBRA Toolbox forum, as described in the "Engaging with The COBRA Toolbox community" tutorial.