

The AMT Team:

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The AMT: The Core

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Outline

- Path handling: `amt_start` and `amt_stop`
- Beyond Matlab/Octave: `amt_mex`, `amt_extern`
- Data functions and auxiliary data: `amt_load`
- The cache: `amt_cache`
- Starting options: `amt_start(...)`
- Licensing and configuration: `amt_info`, `amt_version`
(`amt_configuration`, `amt_basepath`, `amt_auxdatapath`, `amt_auxdataurl`)
- Handling default parameters
- Displaying information: `amt_disp`
- Simulating experiments: `amt_emuexp`

Path Handling

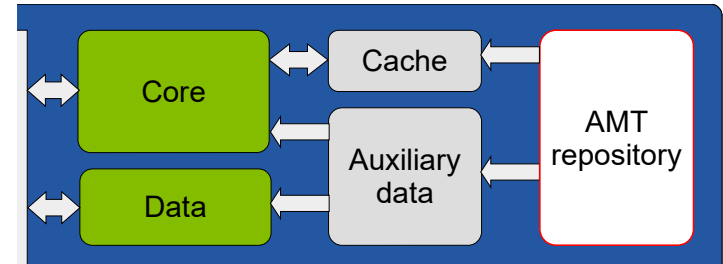
- Required search path?
 - Working directory is the AMT root directory? Nothing to do!
 - Working directory is any other directory? Add the AMT root directory (**only!**) to the search path.
- Use the AMT? Type: `amt_start`
 - Searches for the LTFAT toolboxes
 - Matlab's search path: If found done.
 - Directory `/thirdparty`: If found, set as the search path.
 - Download from the AMT server to `/thirdparty`, set as the search path.
 - Searches for the optional toolboxes
 - Matlab's search path: If found, done.
 - Directory `/thirdparty`: If found, set as the search path.
 - Adds internal AMT directories to the search path
- Done? Type: `amt_stop`
 - Removes the internal AMT directories from the search paths
 - Keeps the directories to toolboxes (for a future start of the AMT)

Beyond Matlab/Octave

- Compile non-Matlab/Octave files: `amt_mex`
 - Details:
 - In Matlab:
 - Windows: `/mex/comp_*.c` and `*comp_.cpp` → `/mex/comp_*.mexw64`
 - Unix: `/mex/comp_*.c` and `*comp_.cpp` → `/mex/comp_*.mexa64`
 - In Octave:
 - `/oct/comp_*.cc` and `comp_*.cpp` → `/oct/comp_*.oct`
 - Files not found in `/oct`: `/mex/comp_*.c` → `/oct/comp_*.mex`
 - On Windows: `/environments/make.bat` → `/environments/**/*.*.dll`
 - On Unix: `/environments/makefile` → `/environments/**/*.*.so`
 - Start other environments: `amt_extern`
 - `output = amt_extern (environment, directory, module, input, out structure)`
 - Currently: Python only

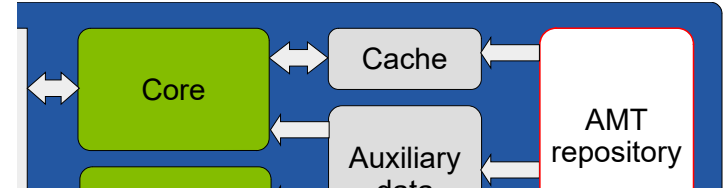
Data and Auxiliary Data

- Access:
 - Data function: `data_<name><year>`,
 - e.g., `data_best2005`
 - `out = amt_load(model, data) ;`
 - Support for: WAV (wave and sampling rate), MAT, and SOFA
- Mechanism:
 - Load the data stored in the local directory `/auxdata`
 - If not found:
 - Search in the online AMT repository <https://amttoolbox.org/amt-version/auxdata> ... and iteratively in previous AMT versions
 - If found, download to the local directory
- Developers:
 - Use the local `/auxdata` for your tests
 - No automatic upload to the online repository, contact the AMT team for upload
 - Do **not** commit binaries to the code repository. Never.



The Cache

- Per default, expect pre-calculated results!
- Cache mechanism:
 - Load the results from the local directory `/cache`
 - If not found:
 - Search in the online AMT repository `https://amtoolbox.org/amt-version/cache` ... and iteratively in previous AMT versions
 - If found, download to the local directory and load the results
 - If not found, **recalculate** the results
- Cache modes: `normal`, `redo`, `cached`, `localonly`
- Usage:
 - On AMT's start: `amt_start(cache mode);`
 - In functions, e.g., `exp_baumgartner2014(figure, cache mode);`
- Developers: `amt_cache`
 - `[var1, var2, ...] = amt_cache('get', file);`
 - `if isempty(var1), calculate; amt_cache('set', file, var1, var2, ...); end`



Start Options: `amt_start(...)`

- `'install'`:
 - Starts the AMT
 - If an optional toolbox not found, downloads it from the AMT server to `/thirdparty`, adds the directory to the search path
 - Triggers the compiler by executing `amt_mex`
- Display modes:
 - `'verbose'`: Display all output, also the calculation progress (default)
 - `'silent'`: Display no output (use when running the AMT in the background)
 - `'documentation'`: Display normal output, but no calculation progress
- Cache modes: `'normal'`, `'redo'`, `'cached'`, `'localonly'`

Licensing and Configuration

- **Licensing:**
 - `amt_info` (function): Display the license of a function (model, experiment, demo, etc)
- **Configuration:**
 - `amt_info`: Display the global AMT configuration
 - `amt_version`: Get and/or display the AMT version
 - `amt_basepath`: Get the AMT root directory
 - `amt_auxdatapath`: Get/Set the local directory of the auxiliary data
 - `amt_auxdataurl`: Get/Set the URL to the auxiliary data
 - `amt_configuration`: Internal function handling much of the above

Handling Default Parameters

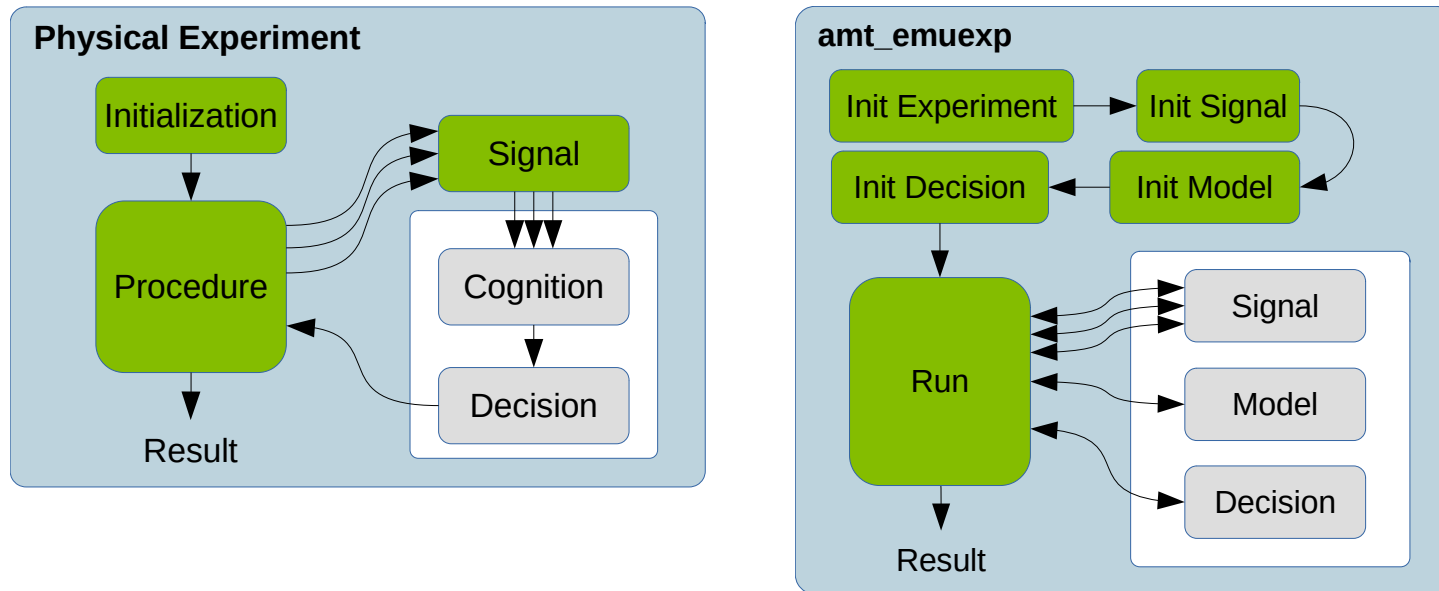
- Default parameters loaded from `/defaults/arg_<function>`
 - In the `arg_` file: A structure called `definput`
- Overwritten by user-parameters provided on calling the function
- Parameter types:
 - Flags: exclusive flags in groups, on call the group name not required, e.g.
 - Definition:
`definput.flags.cachemode={'global','normal','cached','localonly','redo'};`
 - On call: `amt_start(..., 'redo', ...);`
 - Key-value pairs: a key with potential values, on call the key name required, e.g.,
 - Definition: `definput.keyvals.fs = 48000;`
 - On call: `baumgartner2014(..., 'fs', 96000, ...);`
- Works only for fully integrated models (using `ltfatarghelper`)

Displaying Information: `amt_disp`

- Overload for `disp(..)`
 - `disp(..)` not allowed in the AMT!
- `amt_disp(X)`:
 - Just like `disp(X)`, but, the output will not appear in the web documentation
- `amt_disp(X, 'documentation')`:
 - Just like `disp(X)`, but, the output **will** appear in the web documentation
- `amt_disp(X, 'volatile')`:
 - Just like `disp(X)`, but the next output will overwrite this one
 - Useful for showing the progress
 - Note: progress bars (e.g., `waitbar`) are not allowed in the AMT.

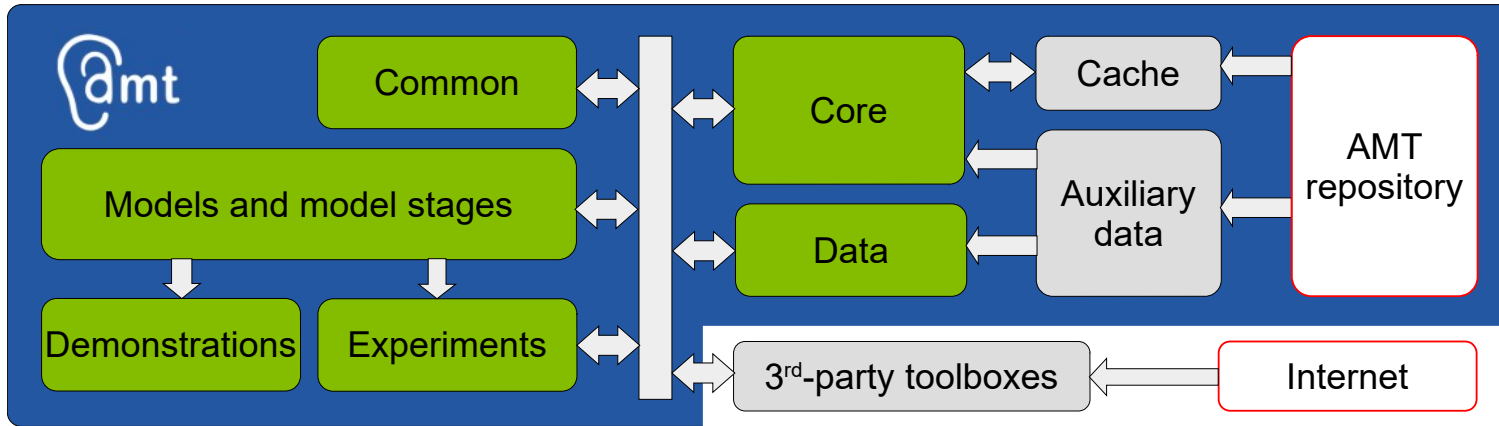
Simulating Experiments

- Simulation of experiments: `amt_emuexp`



- Example: `exp_breebaart2001('b_fig3')`

The Auditory Modeling Toolbox (AMT): The Core



- The core functions: `amt_*`
 - `amt_start`: In the AMT root directory
 - All other `amt_` functions: In the `/core` directory
- Cheat sheet: <http://amttoolbox.org>