Metaheuristic Optimizer – UI CMD commands

app		Application
	exit	Exit application (terminate all solvers and close all UI beforehand)
	info	Show application information (version, date, developers)
	-json	return as json string

cfg		Application Configuration
	<key>	Get value of setting with key
	<key> <value>	Set value of setting with key
	-save	Save settings to mocfg-file in /data/cfg/ directory
	-reset	Reset all settings to default
	-list	List all settings
	-json	return as json string

uif		UiFrontend
	start	Start UiF
	min	Minimize UiF
	show	Show UiF (after minimized)
	status	Get status

wis		WebInterfaceServer
	start	Start the wis
	-n	restart with new random port
	-n <port>	restart with port
	-n <port_min> <port_max>	restart with random port >= port_min && port <= port_max
	-r	restart the wis (port stays the same)
	stop	Stop the wis
	open	Open the WebGUI in browser
	-m	minimize UiFrontend on opening WebGUI
	status	Get status of wis
	-a	get active (true = running, false = not running)
	-p	get port

mv		MO Visualizer
	install	Start the MO Visualizer installer
	start	Start the MO Visualizer

help		Get lists of modules / options with descriptions
	<module>	

ffm		**FitnessFunctionManager**	
	list		List of custom fitness functions
		-json	return as json string
	create <eq>		Create new custom fitness function with equation eq
	modify <id> <eq>		Modify custom fitness function (id) to equation eq
	delete <id>		Delete custom fitness function with id
		<id_min> <id_max>	delete all with id >= id_min && id <= id_max
		-all	delete all custom fitness functions
	set		Set parameters
		<id>	get command for custom fitness function with id
		bdl	get value of default lower boundary
		bdu	get value of default upper boundary
	get		Get equation of custom fitness function (last one) (as LaTeX string)
		<id>	get command for custom fitness function with id
		bdl	get value of default lower boundary
		bdu	get value of default upper boundary
		tree	get equation tree structure as string (for debugging)
		map	get equation function map as string (for debugging)
	lsbd		List the boundaries of hard coded fitness functions (as json)

sm		**Solver Manager**	
	list		List of Solvers
		-r	show only running solvers
		-nr	show only not running solvers
		-t <type>	show only solvers where algorithm is type
		-c <creator>	show only solvers where creator (source) is creator
		-s <status>	show only solvers with status
		-s <status_min> <status_max>	show only solvers with status between min and max
		-id <id>	show only solver with id
		-id <id_min> <id_max>	show only solvers with id between min and max
		-json	return as json string
	create		Create new solver (default)
		<type>	create new solver with given type
	clone		Create new solver with cloned configuration
		<id>	configuration cloned from solver with given id
	config		Configure solver (without specified id it configures last solver[1])
		<id>	configure solver with id
		<id_min> <id_max>	configure all solvers with id >= id_min && id <= id_max
		<HyperParam>=<value>, …	set value of parameter, multiple parameters at once possible
		-get	get current configuration
		-json	return as json string
		-reset	reset solver(s)

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[1] Last solver in the solvers list (= solver with highest id)

```
              -clone <id>                            clone configuration from solver with given id
        solve / start                       Start solver (without specified id it starts last solver)
              <id>                                   start solver with id
              <id_min> <id_max>                      start all solvers with id >= id_min && id <= id_max
        term                                Terminate solver (without specified id it terminates last solver)
              -all                                   terminate all solvers
              <id>                                   terminate solver with id
              <id_min> <id_max>                      terminate all solvers with id >= id_min && id <= id_max
        status                              Get status (without specified id it gets status of last solver)
              <id>                                   get status of solver with id
        result                              Show result (without specified id it shows result of last solver)
              <id>                                   show result of solver with id
              -json                                  return as json string
        clear                               Clear solver (without specified id it clears last solver)
              -all                                   clear all solvers (if not running)
              <id>                                   clear solver with id
              <id_min> <id_max>                      clear all solvers with id >= id_min && id <= id_max
        delete                              Delete solver (without specified id it deletes last solver)
              -all                                   delete all solvers
              <id>                                   delete solver with id
              <id_min> <id_max>                      delete all solvers with id >= id_min && id <= id_max
        lsalgo                              List all implemented algorithms
              -json                                  return as json string
        lspars <algo>                       List used parameters for specified algorithm
              -json                                  return as json string
```

om	**Optimizer Manager**
	All commands as for Solver Manager if not differently specified
config	
`<HyperParam>=<min>/<max>, …`	set min/max value of parameter for solver
`-addSHP <HyperParam>=<min>/<max>, …`	add solver hyperparameter that should be optimized
`-rmvSHP <HyperParam>, …`	remove solver hyperparameter

Examples

```
>> sm list -r -json
>> sm create DErand1
>> sm result
>> sm config 3 4 -reset
>> sm config -clone 2
>> sm config 5 -clone 3
>> sm config 4 -get -json
>> sm config 2 N=123 NP=456
>> sm solve 1 5
>> help
>> help sm

>> om config NP=200/400
>> om config 0 1 -addSHP NP=100/1000
>> om config 1 -rmvSHP NP
>> om config -addSHP CR=0,1/0.9
```

How to start a solver

```
>> sm create DErand1
>> sm config N=123, NP=1234, …
>> sm solve
>> sm status
>> sm result
```

Fun stuff (WebGUI only)

```
>> sfx on
>> sfx off
>> sfx v+
>> sfx v-
>> show me memes
>> memes
>> easteregg
```