

WOSD 2018: optiSLang recent developments

David Schneider

optiSLang product manager

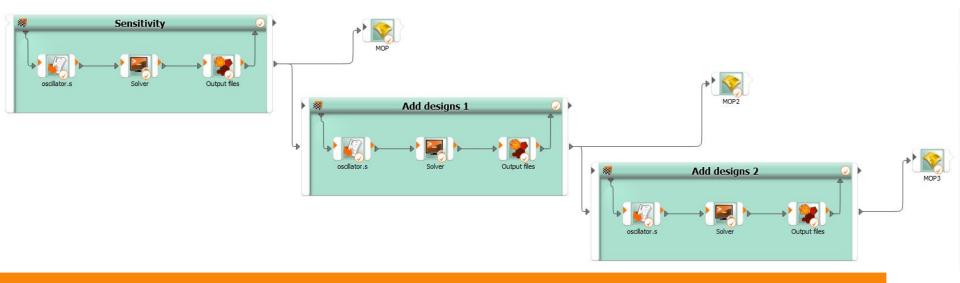




Classical Approach

If CoP's are need improvement after initial DOE:

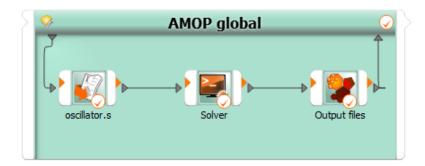
- 1. Deactivate outliers
- 2. ...
- 3. Add another N Designs
- 4. Build another MOP and check
- → Repeat 1-4 until CoP's are good (or max. solver runs reached)



Adaptive MOP

• Automatic approach – single system

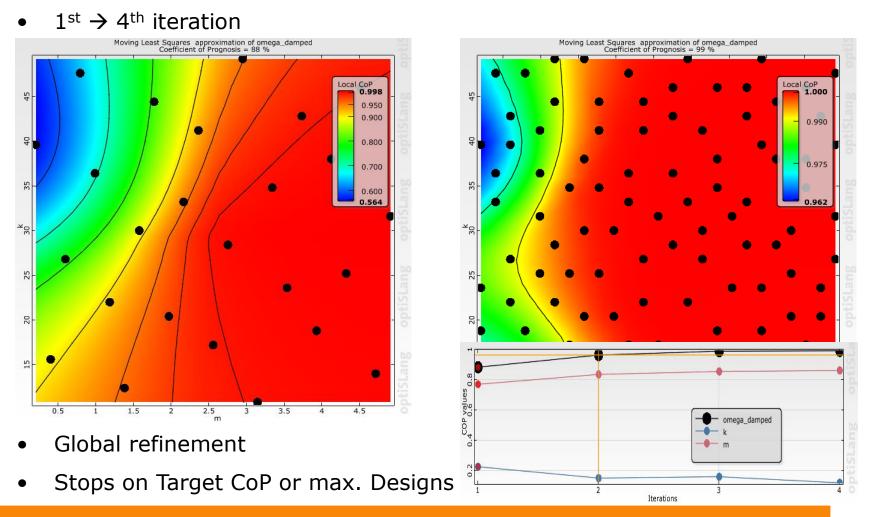
"Refine DOE until ..."



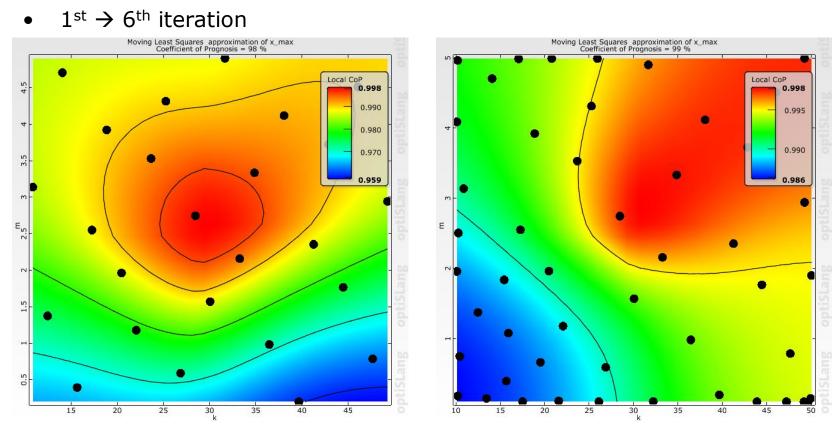
Adaption					
Refinement type:	Global				
Maximum number of samples:	100				
Target CoP:	0.99				

- ➔ Minimal setting (advanced still allowed)
- ➔ More efficient work with optiSLang

AMOP – Exploration (global)

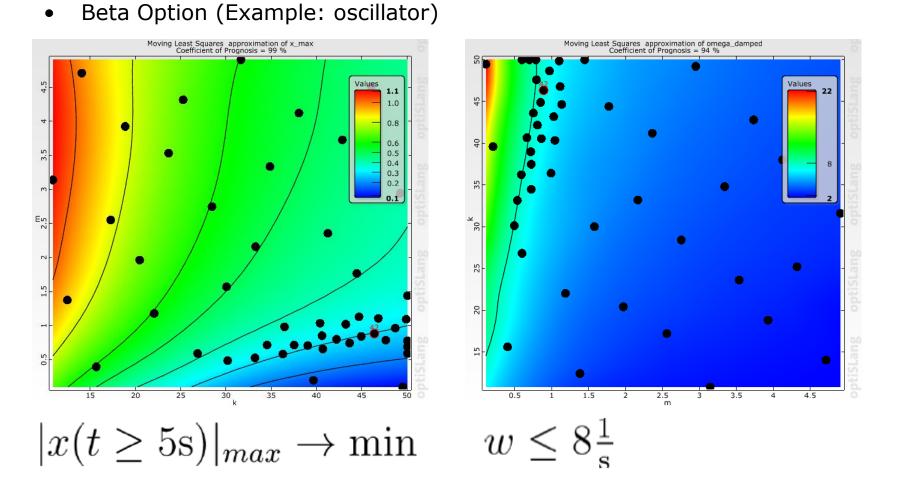


AMOP – Local CoP



- Local refinement
- Improves quality of metamodel

AMOP – Criteria based



 -	<i>a</i> .		



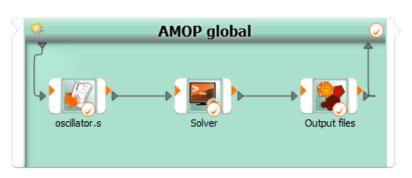
Automatic approach – single system

• For advanced users: combine the 3 refinement types

Importance of sample density: 20%	
_	
Importance of local CoP: 50%	
Importance of optimization criteria: 30%	
Number of samples per iteration: 5	

Adaptive MOP





dynardo



Integrations



New Integrations in v7

- 9 New integrations
- 6 New solver wizards



Integrations LSDSO_sensi Other plugins like 🧹 САТІА run LSDSO AEDT output actuator inputs NX • Catia • StarCCM • GTSUITE Git • CST STARCCM • tuning_fork.prt Sensitivity 8 Outlook: Next integrations in optiSLang installer CST **ANSYS Electronics Desktop** KULI • KULI ANSA / META • Kuli • ANSA META

Contact support@dynardo.de if you like to use one of those plugins

© Dynardo GmbH

Outlook: Parametrize optiSLang projects

• For Subprojects, collaborative work, ...

Scenery		root_param			×						
					_		Project Settings				
	III 📈 >>> 🧱 >>> 🎥 III>	Working data Purge Advanced Parametric									
		22 III	Parameter		It designs Reference valu	e Constant	Value type	Resolution	Range R	ange plot	
	ANSYS			1 area01	Optimization	10		REAL	Continuous	0.1 20	
	Input	Solve F	Results	2 area02	Optimization	10		REAL	Continuous	0.1 20	
				3 area03	Optimization	10		REAL	Continuous	0.1 20	
				4 area04	Id	Minimum	user level		Value		Description
				5 area05	loadcase	🔞 Comput	ation Enginee	r 🚠 Ic2			
				2	env_vars	🔆 Flow Eng	ineer	🕘 INPU	T_FILE1=tr	uss_lc2.inp	
		Soncitivity		3	input_deck	🔆 Flow Eng	ineer	€:\ Z:/so	oftware/pre	sentation/o	
			4	max_runtime	🐞 Comput	ation Enginee	r z 100				
		T								new placeholde	
	5			5	new placeholde	new placeho	lder	new plac	eholder		
		+		5	new placeholde	r new placeho	lder	new plac	eholder		new placeholde
			CED	5	new placeholder	r new placeho	lder	new plac	eholder		new piscenoice
	Costs		CFD	5	new placeholder	r new placeho	lder	new plac	eholder		new proceroide



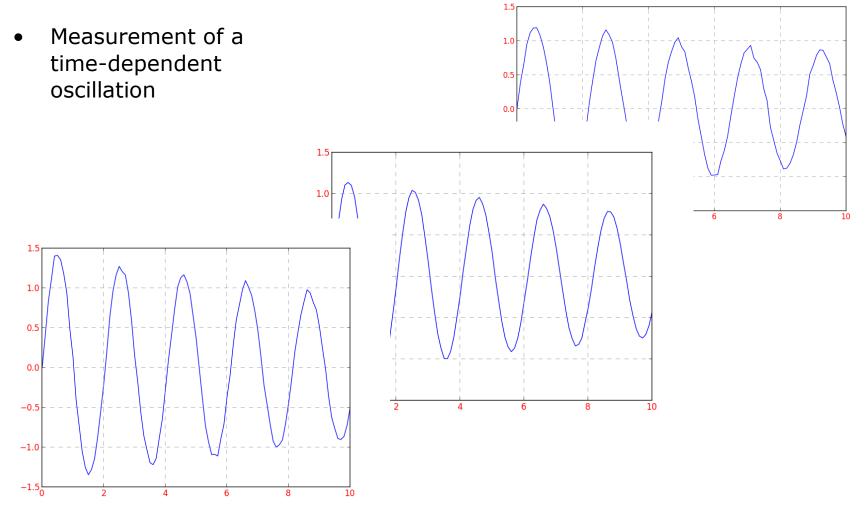
Digital Twin



"combine sensor data with detailed product simulation"

13

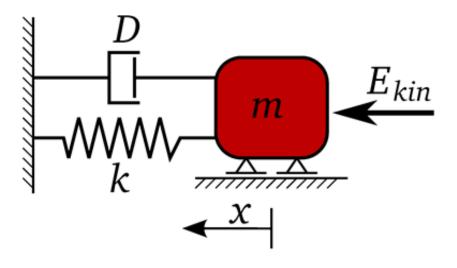
Sensor data



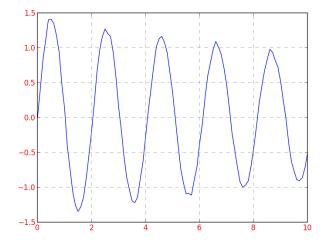
Motivation

Customer or Customer of customer ...

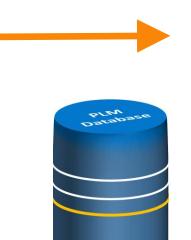
- \rightarrow Look into the product (simulation shows what can not be measured)
- \rightarrow Manage maintenance
- \rightarrow Find optimal operating parameters
- \rightarrow ...
- → Traceable processes & results
- \rightarrow Web-based (everywhere, everytime)
- \rightarrow ...



Identify the parameters



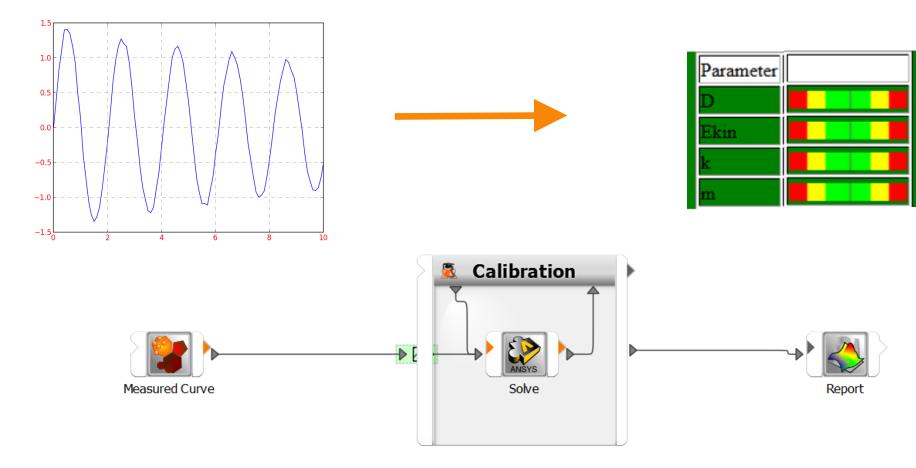
...Simulation...



Parameter	
D	
Ekin	
k	
m	

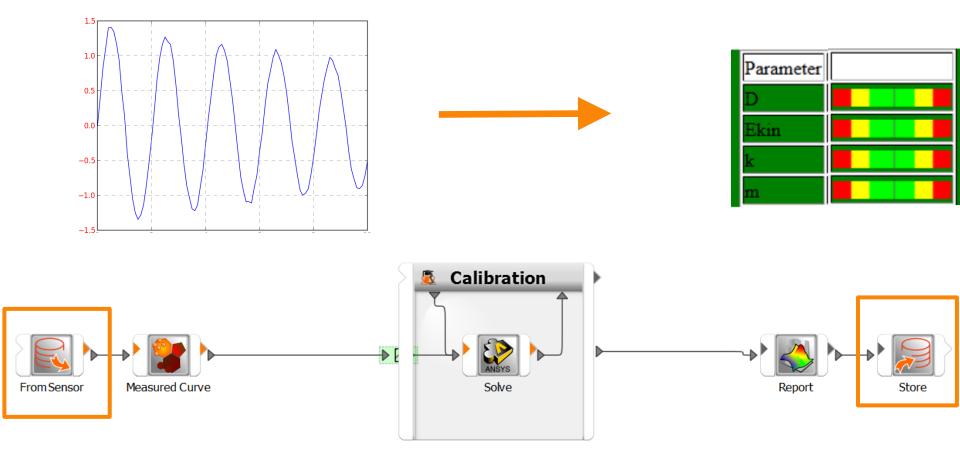
Machine condition calibration flow

• Generate an identification flow in optiSLang



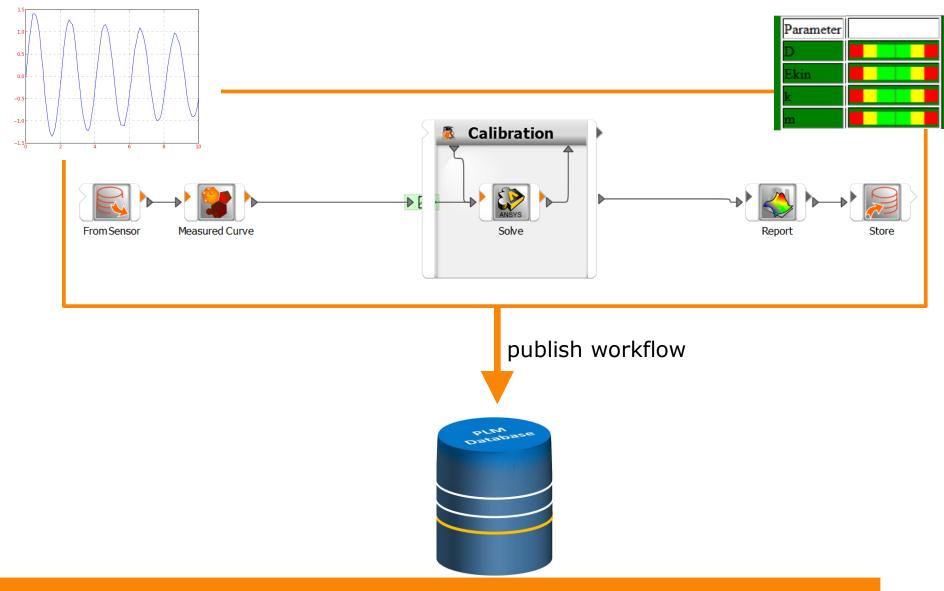
Connect to database

• Automatically receive sensor data & store results → Traceablity



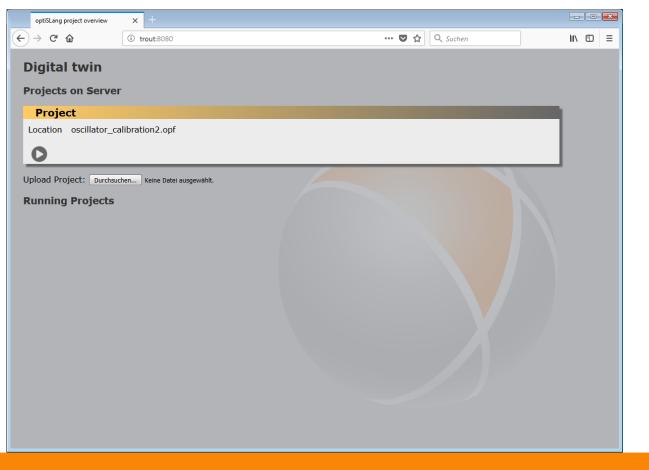
To "The Cloud"

dynardo



Start, monitor and control in Web-browser

- No installation needed
- No need to know algorithms, solver, optiSLang, databases, HPC, ...



http://10.253.252.116:8082/

Server 2

optiSLang project overview	x +				
$\overleftarrow{\bullet}$ \rightarrow C' \textcircled{a}	(i) trout:8080	•••	♥ ☆	Q Suchen	D ≡
Digital twin					
Projects on Serve	r				
Project					
Location oscillator_ca	alibration2.opf				
0					
Upload Project: Durchsu	chen oscillator_calibration2.opf Upload succe	essful.			
Running Projects					

Start, monitor and control in Web-browser

- No installation needed
- No need to know algorithms, solver, optiSLang, databases, HPC, ...

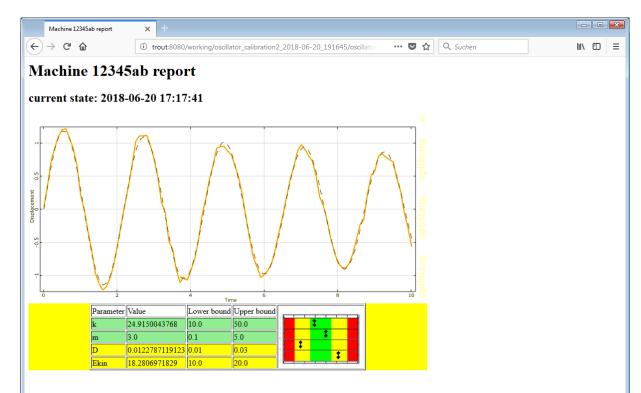
optiSLang project over	view X +							
-) → C û	i trout:80	080		··· 🛡 🟠 🔍	Suchen		lii\ C	
Digital twi								
Project						_		
Location oscilla	tor calibration2.	.opf						
•	-							
0								
Upload Project:	Durchsuchen oscillat	tor_calibration2.opf						
Running Proje	ects							
oscillator_	calibration2	*FINISHED* <u>Repo</u>	ort in the second se					
Location	working\oscillat	tor_calibration2_2018-06-2	20_191645\oscillator_cali	bration2.opf				
Server Address	127.0.0.1							
Port	5310							
Nodes	Evolutionary Alg Text Input Sta Batch Script S ETK Status: P check_condition PP_paramter St Postprocessing	ent Status: Processing don gorithm Status: Processing atus: Processing done Status: Processing done Processing done 1 Status: Processing done tatus: Processing done Status: Processing done ame Status: Processing done Processing done	g done Succeeded: 200	Failed: 0 Pending	: 0			
	×	to cooking done						
	~							

Server 2

Server 1

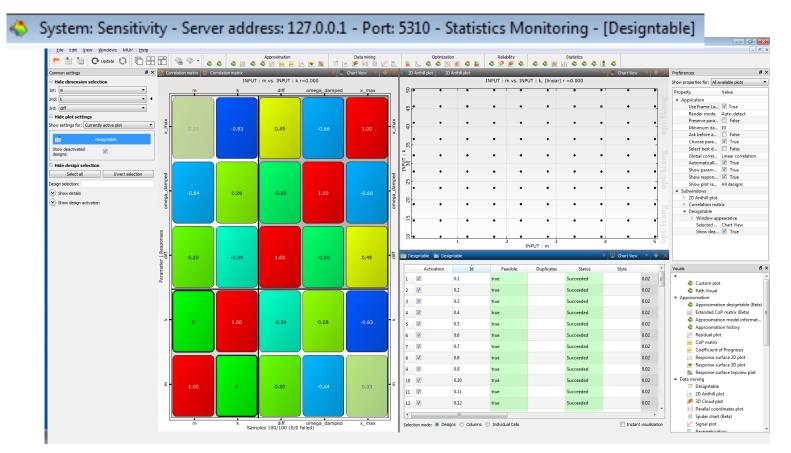
Start, monitor and control in Web-browser

- No installation needed
- No need to know algorithms, solver, optiSLang, databases, HPC, ...



Remote Postprocessing (Beta)

• ... and for those who want to use full post processing ...



optislang -b --start-monitoring --connect-tcp --system-name Sensitivity



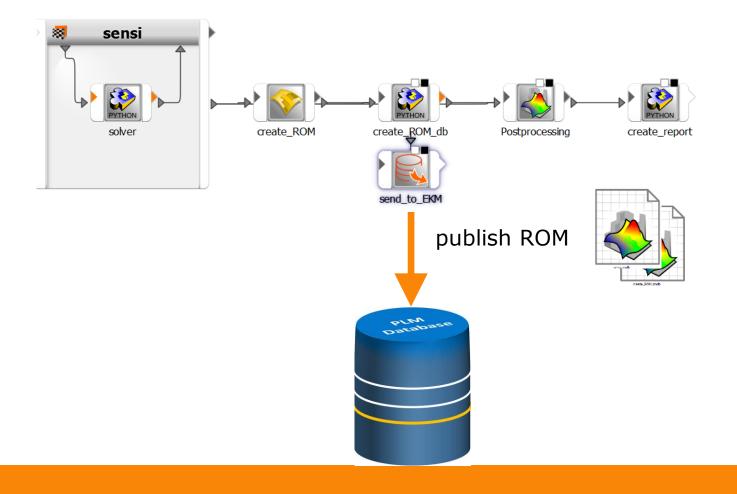
Operation



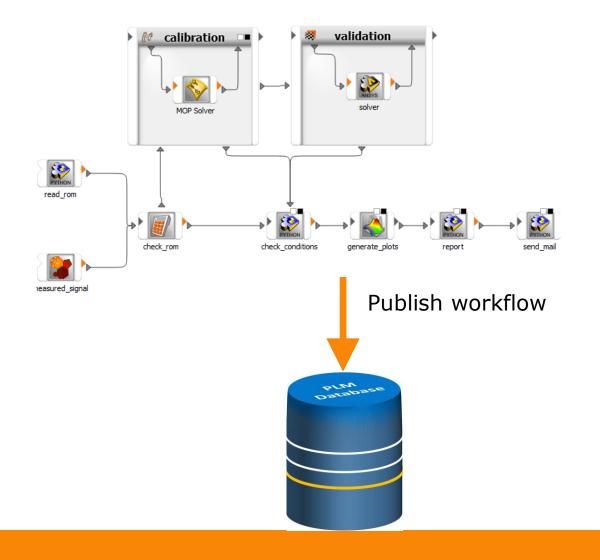
"We need operating parameters immediately"

Generate and publish ROM's

- → Workflow in optiSLang including MOP algorithm
- ➔ Creates fully automatic the data-based ROM (MOP) based on up-front simulations within a <u>predefined variation space</u>



→ Calibration workflow in optiSLang



dynando



WOSD 2018: optiSLang recent developments

David Schneider

optiSLang product manager