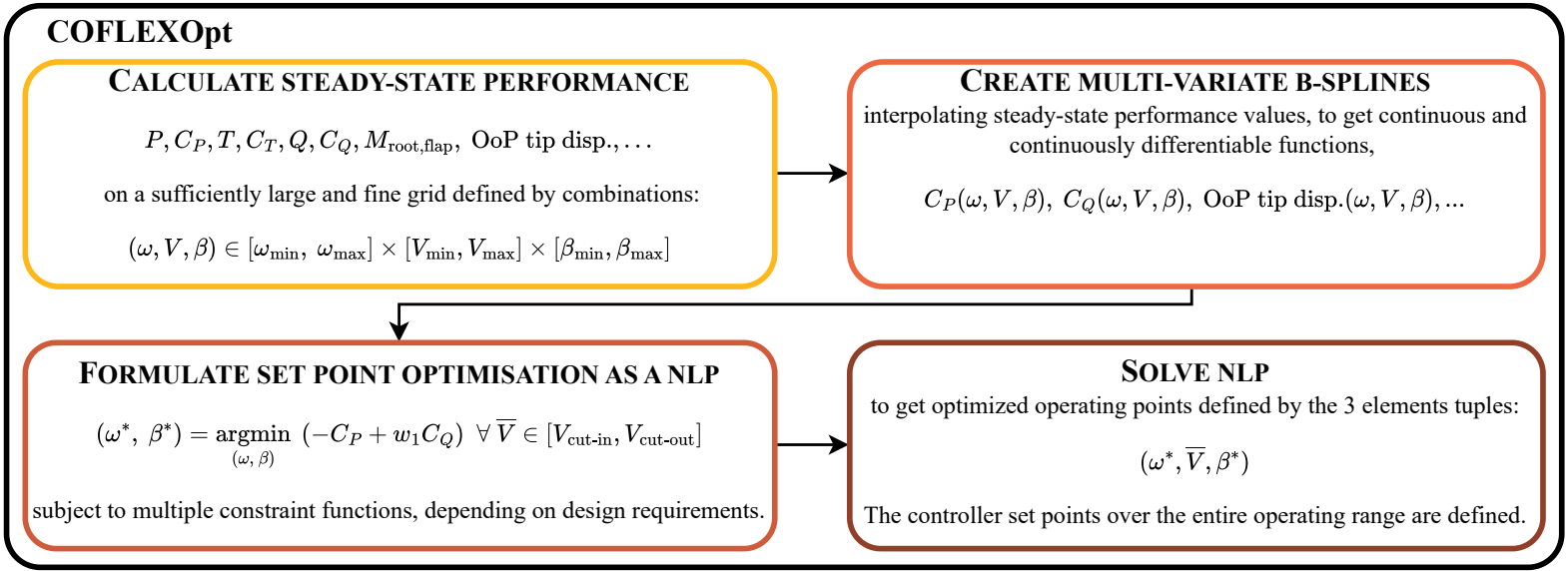
COFLEXOpt
CALCULATE STEADY-STATE PERFORMANCE
$P, C_P, T, C_T, Q, C_Q, M_{\text{root,flap}},$ OoP tip disp., ...
on a sufficiently large and fine grid defined by combinations:
$(\omega, V, \beta) \in [\omega_{\min},\ \omega_{\max}] \times [V_{\min}, V_{\max}] \times [\beta_{\min}, \beta_{\max}]$
CREATE MULTI-VARIATE B-SPLINES
interpolating steady-state performance values, to get continuous and continuously differentiable functions,
$C_P(\omega, V, \beta),\ C_Q(\omega, V, \beta),$ OoP tip disp.(ω, V, β), ...
FORMULATE SET POINT OPTIMISATION AS A NLP
$(\omega^*,\ \beta^*) = \underset{(\omega,\ \beta)}{\text{argmin}}\ (-C_P + w_1 C_Q)\ \ \forall\, \overline{V} \in [V_{\text{cut-in}}, V_{\text{cut-out}}]$
subject to multiple constraint functions, depending on design requirements.
SOLVE NLP
to get optimized operating points defined by the 3 elements tuples:
$(\omega^*, \overline{V}, \beta^*)$
The controller set points over the entire operating range are defined.