Optimality assesment Robustness and flexibility assessment Start Start Initialize design robustness vector Initialize design optimality vector $\mathbf{N}_{R} = \left[n_{R1} \, n_{R2} \cdots n_{R\beta} \, \right]^{1} = \mathbf{0}$ $\mathbf{N}_E = \left[n_{E1} \, n_{E2} \cdots n_{E\beta} \, \right]^{\mathsf{T}} = \mathbf{0}$ Sample a requirement arc from Ω_R Sample design arc from Ω_{cD} $f(c, \mathbf{S}, \mathbf{R}_w)$ min Sample a requirement arc from Ω_R **subject to** $\mathbf{g}(c,\mathbf{S},\mathbf{R}_w) \leq \mathbf{0}$ Generate a decision arc Optimum decision arc $\gamma \leftarrow \gamma + 1$ $\{c,\mathbf{S}\}_{\nu}$ $\mathbf{x}_{S}^{*}(\mathbf{R}_{w}) = \{c^{*}, \mathbf{S}^{*}\}$ $\lambda \leftarrow \lambda + 1$ $w \leftarrow w+1$ Optimum design arc Check reliability constraint all enumerations no $\mathbf{x}^*(\mathbf{R}_w) = \{c^*, \mathbf{D}^*\}$ $w \leftarrow w+1$ $\mathbf{g}(c,\mathbf{S},\mathbf{R}_w) \leq \mathbf{0}$? generated? $\gamma = \xi$? Augment set of parameteric optimal ves yes design arcs $\{c, \mathbf{D}\}_{\lambda}$ does not satisfy requirement \mathbf{R}_{w} $S_E^* = \{\mathbf{x}^*(\mathbf{R}_1), \mathbf{x}^*(\mathbf{R}_2), \dots, \mathbf{x}^*(\mathbf{R}_w)\}$ $\{c, \mathbf{D}\}_{\lambda}$ satisfies requirement \mathbf{R}_{w} Award design arc in N_E Award design arc Do not award design arc $n_{E\lambda} \leftarrow n_{E\lambda} + 1$ $n_{R\lambda} \leftarrow n_{R\lambda} + 0$ $n_{R\lambda} \leftarrow n_{R\lambda} + 1$ All samples evaluated? Update design robustness vector $\mathbf{N}_{R} = \left[n_{R1} \, n_{R2} \cdots n_{R\beta} \, \right]^{\mathrm{T}}$ yes α design arcs with largest values $n_{E\lambda}$ no All samples evaluated? Set of optimal design arcs yes $S_{E} = \{\{c, \mathbf{D}\}_{E1}, \{c, \mathbf{D}\}_{E2}, \dots, \{c, \mathbf{D}\}_{E\alpha}\}$ Compute filtered outdegree $FO_{\lambda} = q - o$ Stop Augment design flexibility vector $\mathbf{N}_F = \left\lceil FO_1 \, FO_2 \cdots FO_{\lambda} \, \right\rceil^{\mathrm{T}}$ Set of optimal design arcs with respect to excess noAll samples evaluated? yes Stop α design arcs with largest α design arcs with largest values FO_{λ} values $n_{R\lambda}$ Set of robust design arcs Set of flexible design arcs