



Project Planning for AI-supported CAE

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Best practices – starting AI

- Start from scratch
- Involve AI and simulation experts from the beginning
- Simulate in tandem with AI modeling
- The AI expert must understand simulations

Evolution in CAE



Handle complex
simulations



Collaboration



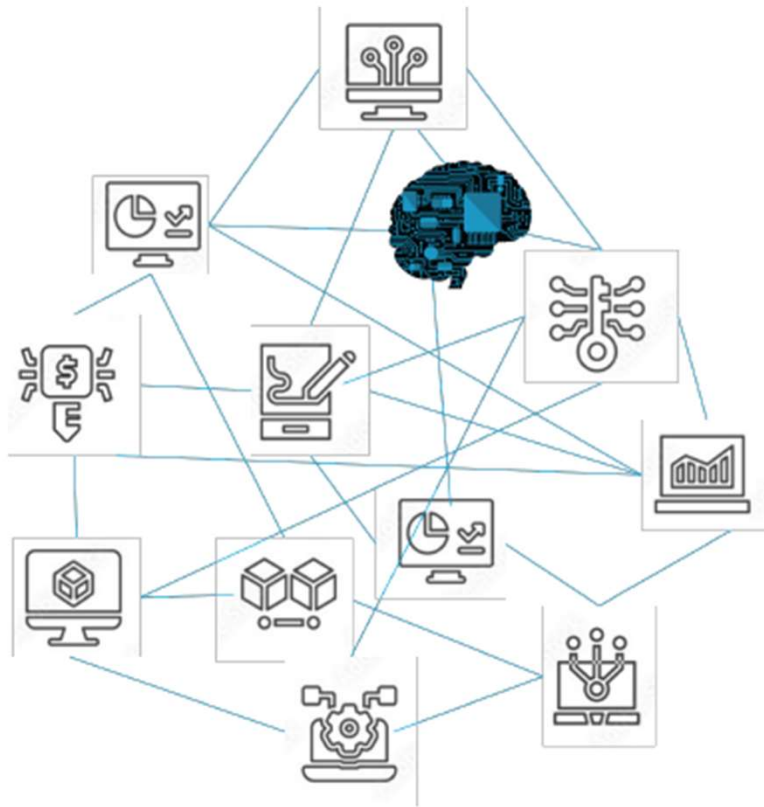
Safe time & costs



Data & Skills

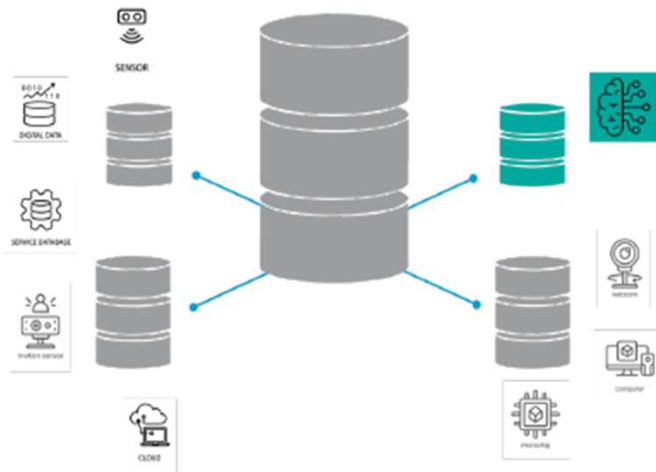
=> A challenging transformation with high impact and potential

Tackling Complex Challenges



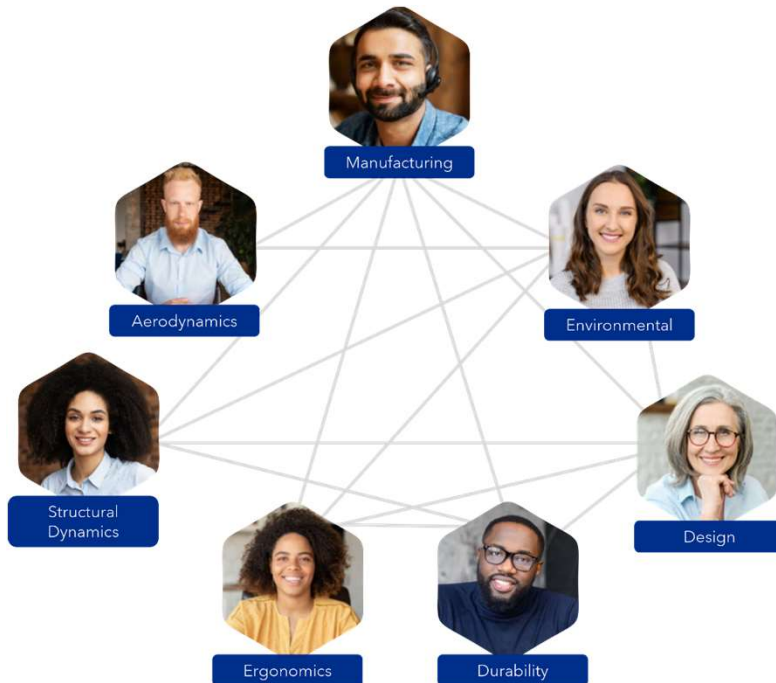
- Complexity reduction
- Unveiling hidden patterns
- Adaptive problem solving

Filling Data Gaps



- Predictive parameter estimation
- Enhancing Data Integrity
- Custom material profiling

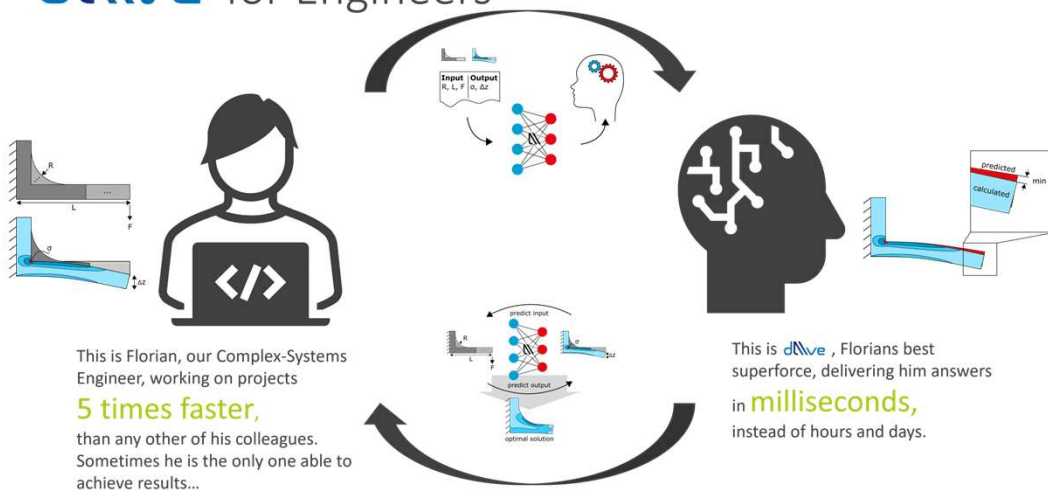
Boosting Collaboration



- Cross-disciplinary insights
- Seamless data transfer and model compatibility
- Reduced data volume
- Real-time issue resolution

Accelerating the process

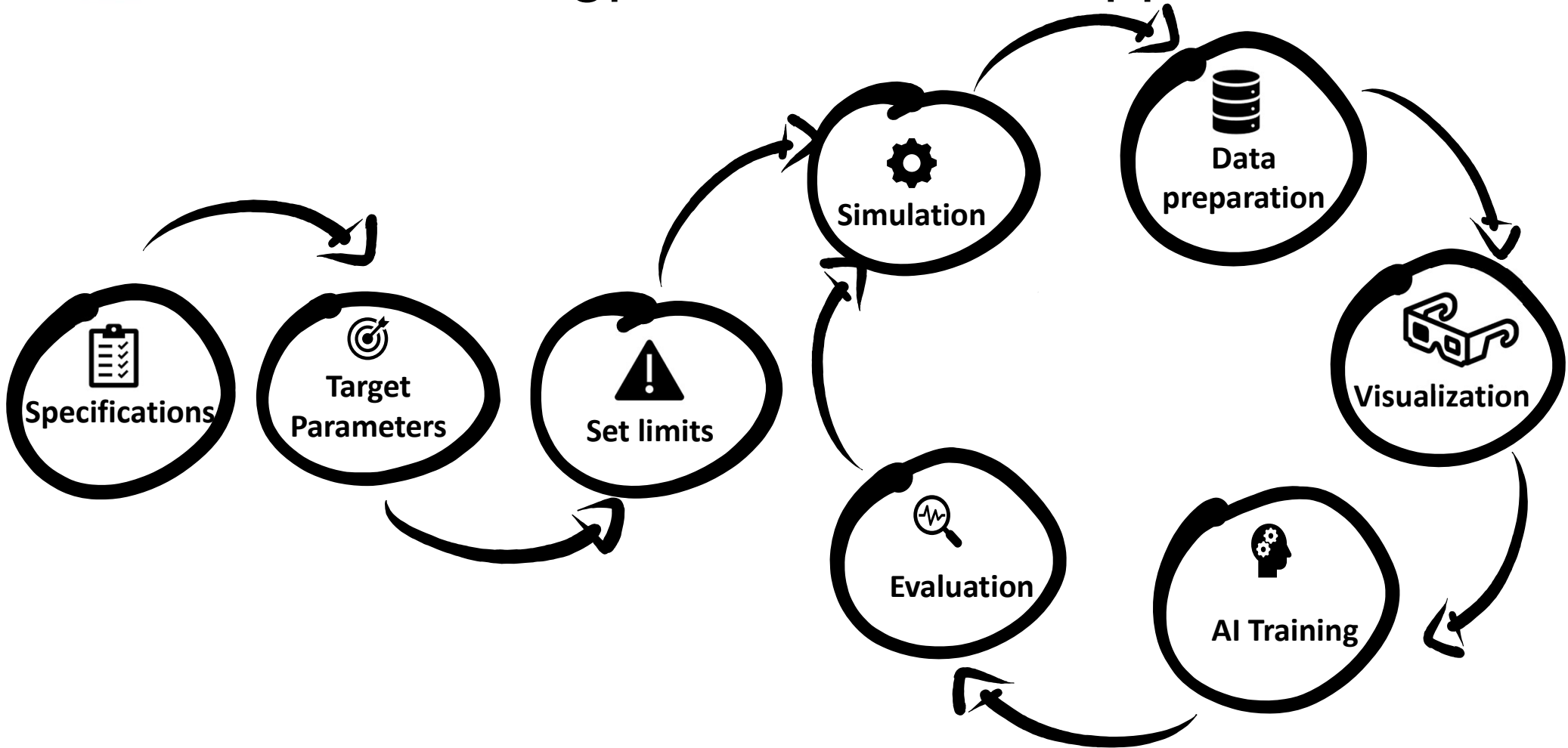
dLive for Engineers



- Quick trial and testing
- Real-time feedback
- Efficiency in computation



Planningprocess for AI supported CAE



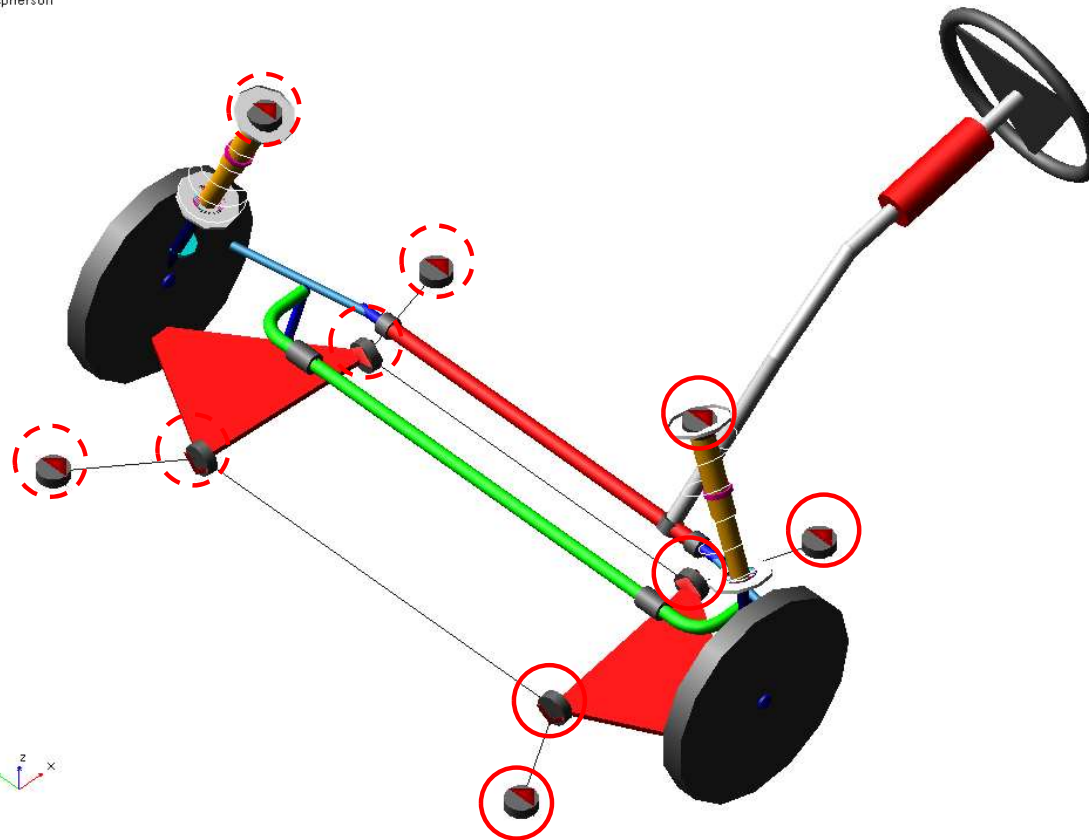



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Overview Model

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 Hard Points
Position x, y, z

 Mirror symmetry
around XZ plane

+ spring stiffness
+ damping coefficient

13 inputs
3 outputs



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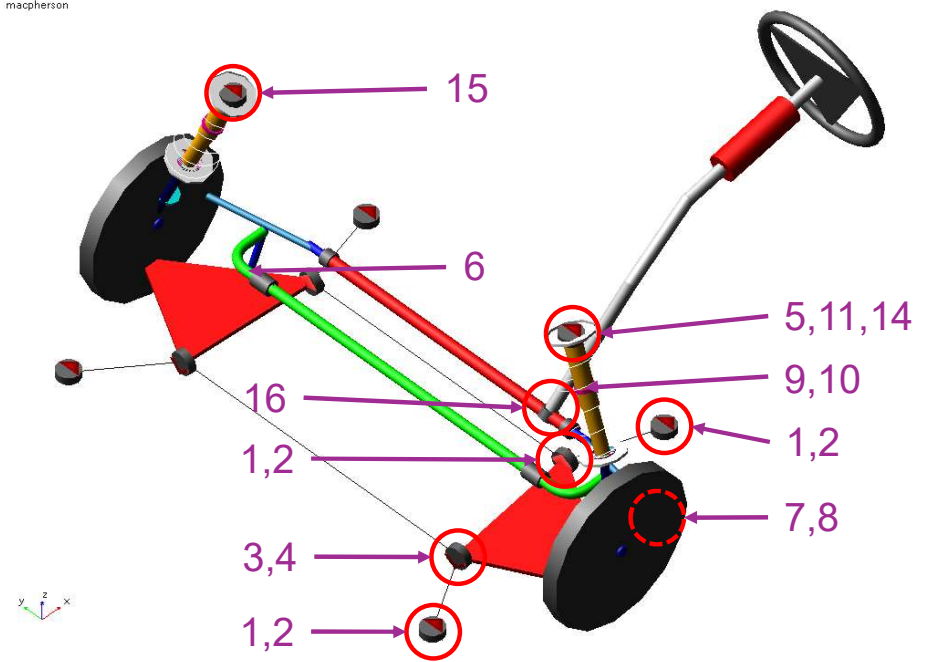




Target Parameters

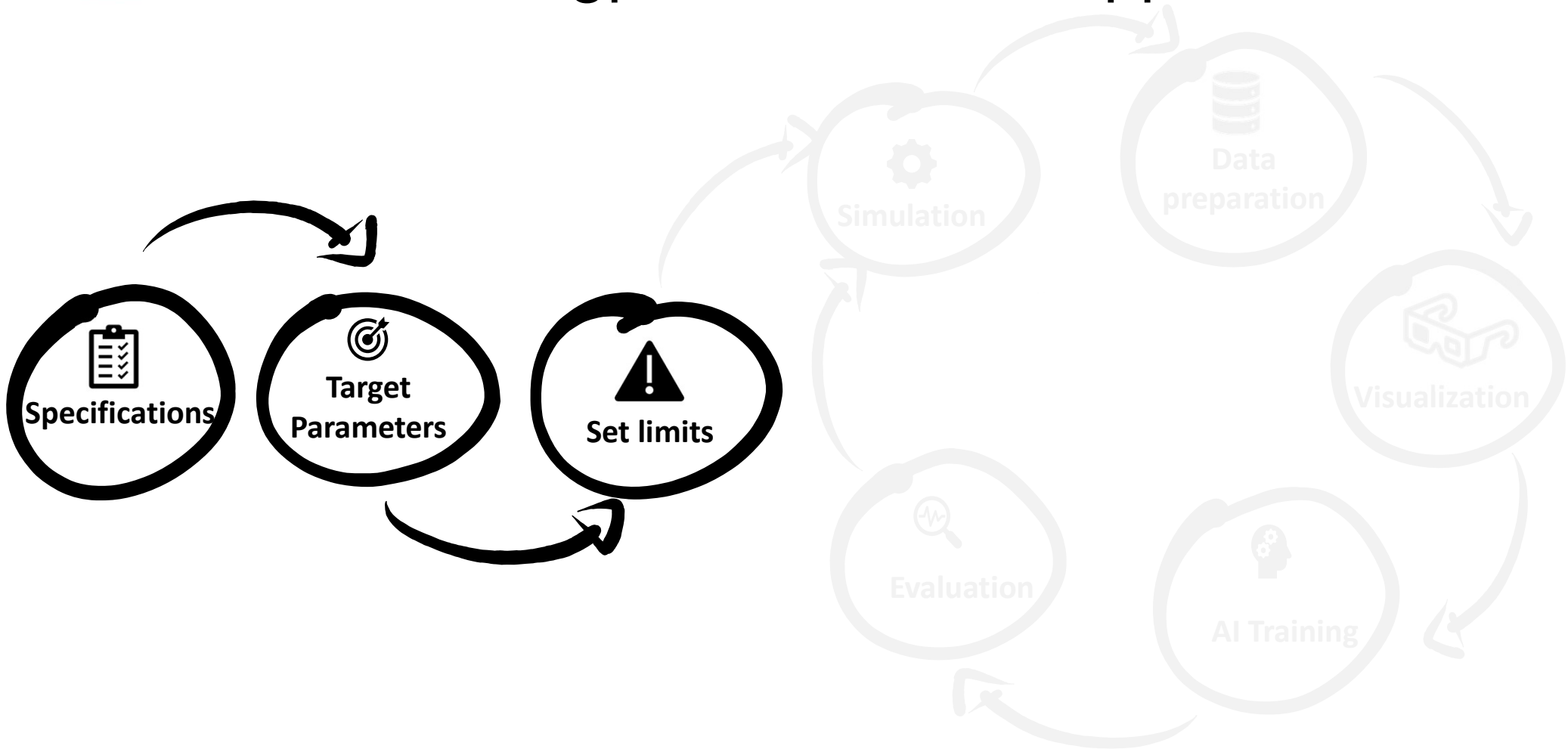
Category	Parameter	Unit	Pos
Geometry	X – Hard Point left control arm rear	mm	1
	Y – Hard Point left control arm rear	mm	2
	X – Hard Point left control arm front	mm	3
	Y – Hard Point left control arm front	mm	4
	Y – Hard Point top mount	mm	5
	Y – Hard Point left Droplink	mm	6
	Z – Hard Point left Droplink	mm	7
	Y – Hard Point left Rack House Mount	mm	8
Scale Factors	Compression - Shock Absorber	1	9
	Rebound - Shock Absorber	1	10
	Top Mount Z Force	1	11
	Bushing lca front lateral damping force	1	12
	Bushing lca rear lateral damping force	1	13
Result Parameters	max force top mount left	N	14
	max force top mount right	N	15
	max torque pinion	Nm	16

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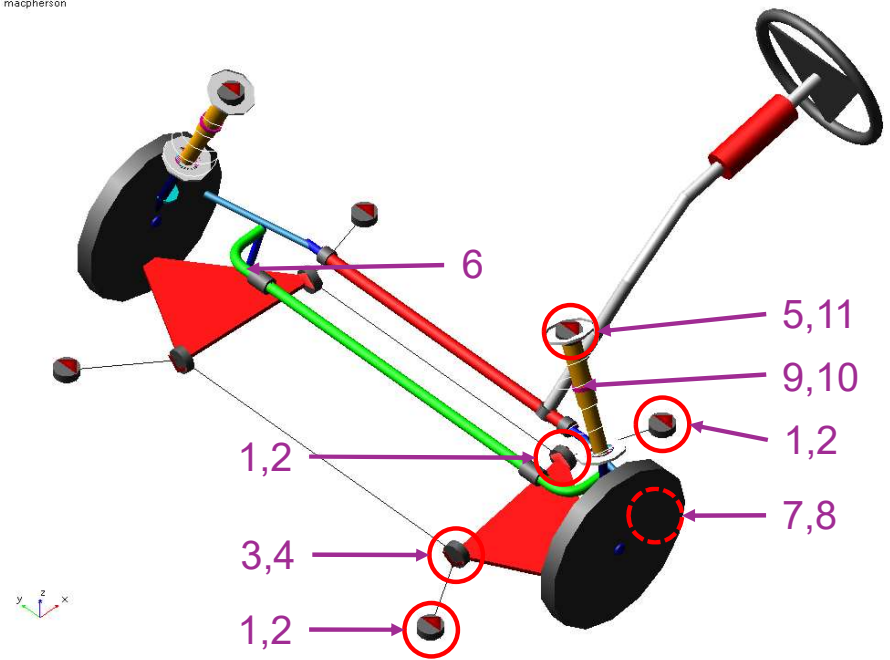




Set Limits

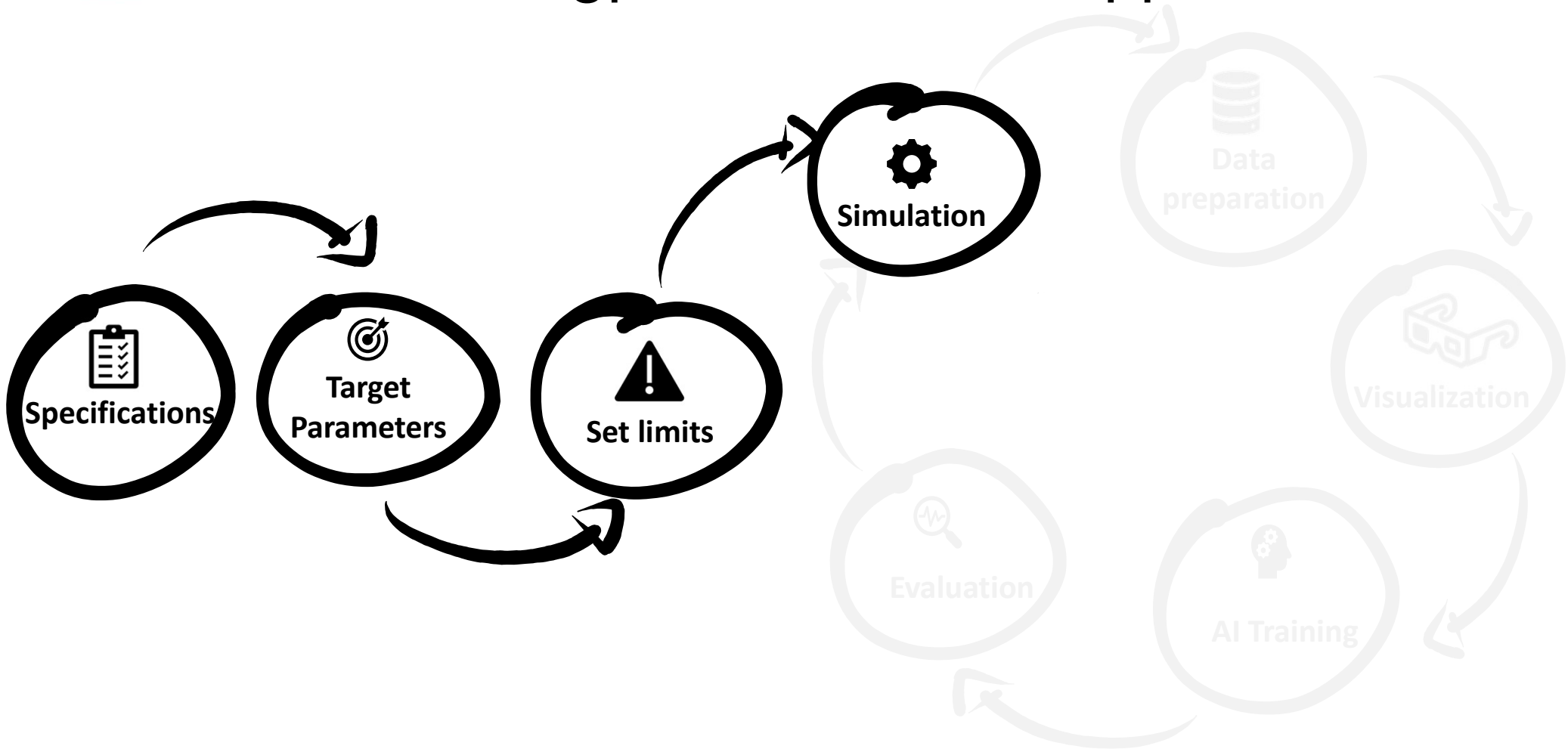
Category	Parameter	Limits	Unit	Pos
Geometry	X – Hard Point left control arm rear	150 250	mm	1
	Y – Hard Point left control arm rear	-450 -350	mm	2
	X – Hard Point left control arm front	-250 -150	mm	3
	Y – Hard Point left control arm front	-450 -350	mm	4
	Y – Hard Point top mount	-550 -500	mm	5
	Y – Hard Point left Droplink	-600 -500	mm	6
	Z – Hard Point left Droplink	100 200	mm	7
	Y – Hard Point left Rack House Mount	-400 -300	mm	8
Scale Factors	Compression - Shock Absorber	0.7 1.3	mm	9
	Rebound - Shock Absorber	0.7 1.3	mm	10
	Top Mount Z Force	0.8 1.2	MPa	11
	Bushing lca front lateral damping force	0.5 2.5	MPa	12
	Bushing lca rear lateral damping force	0.5 2.5	1	13

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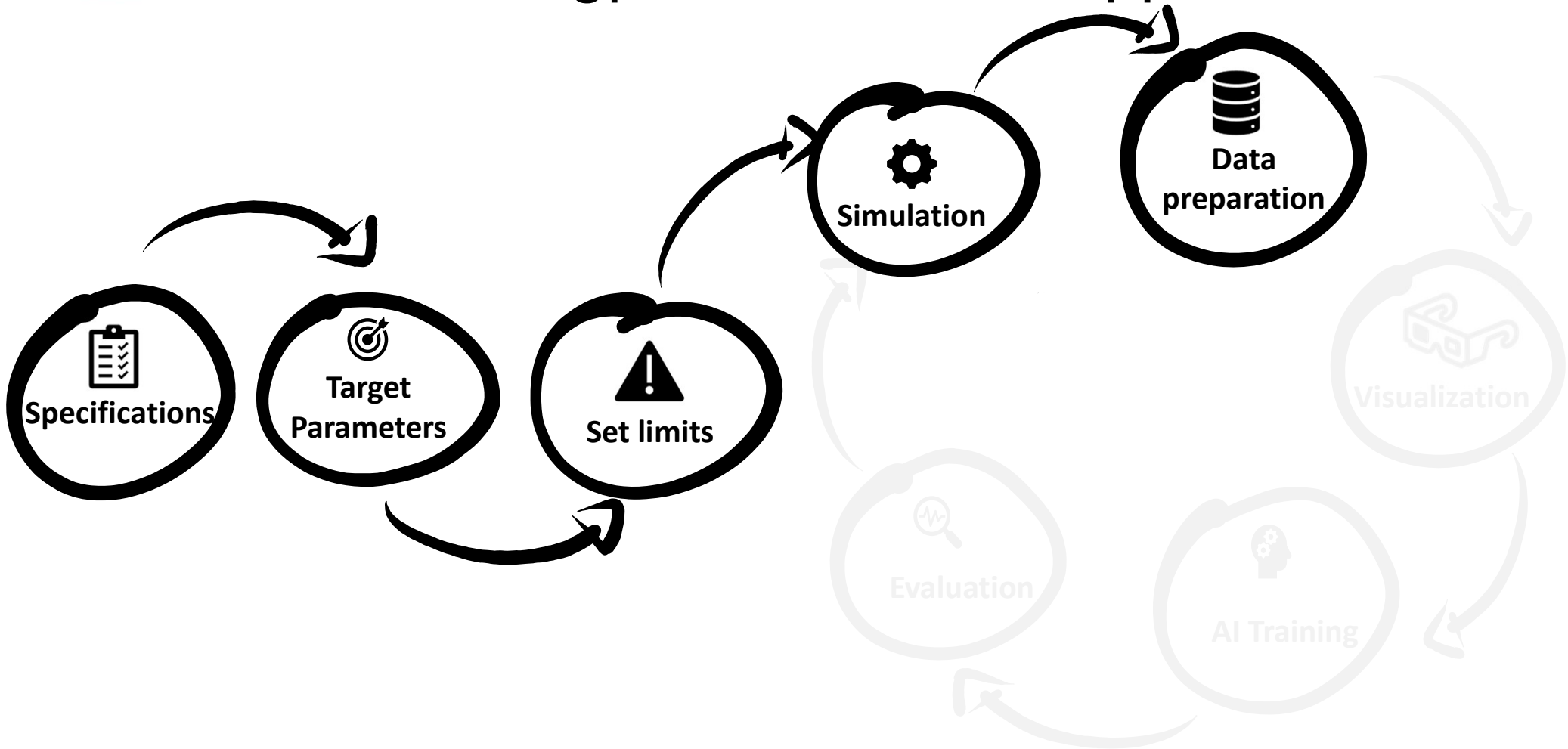


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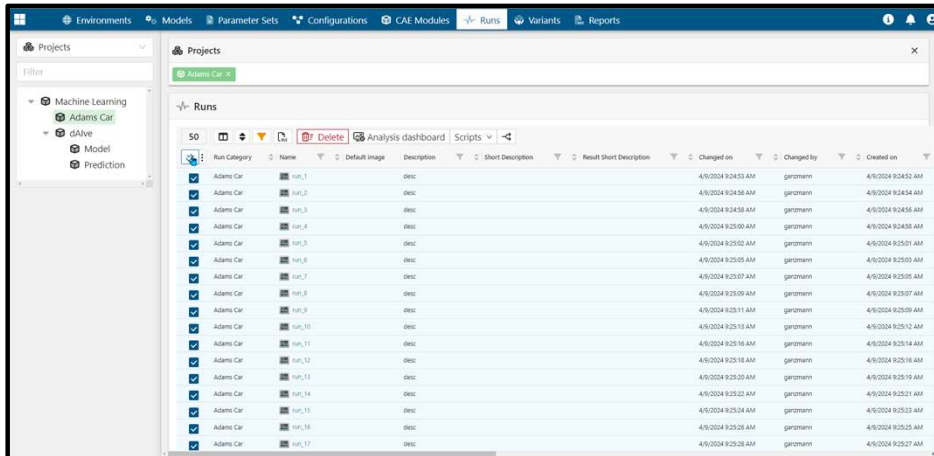
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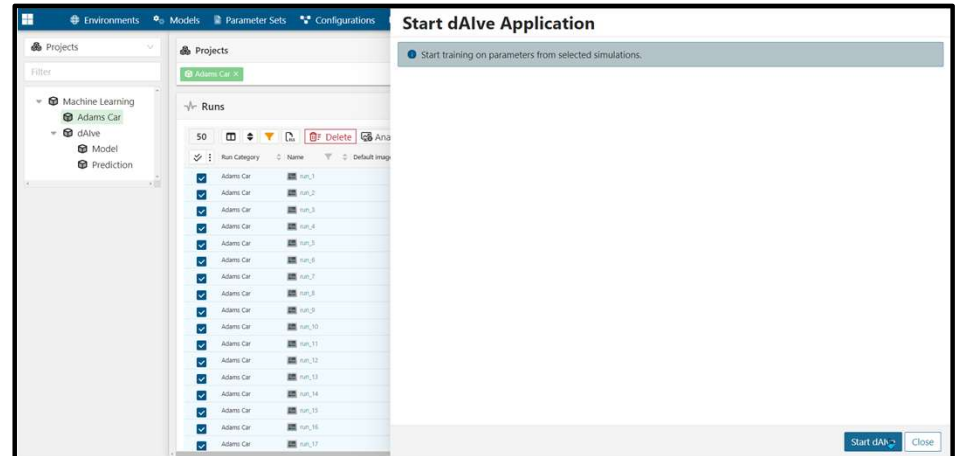


Data Preparation

Selection of simulations

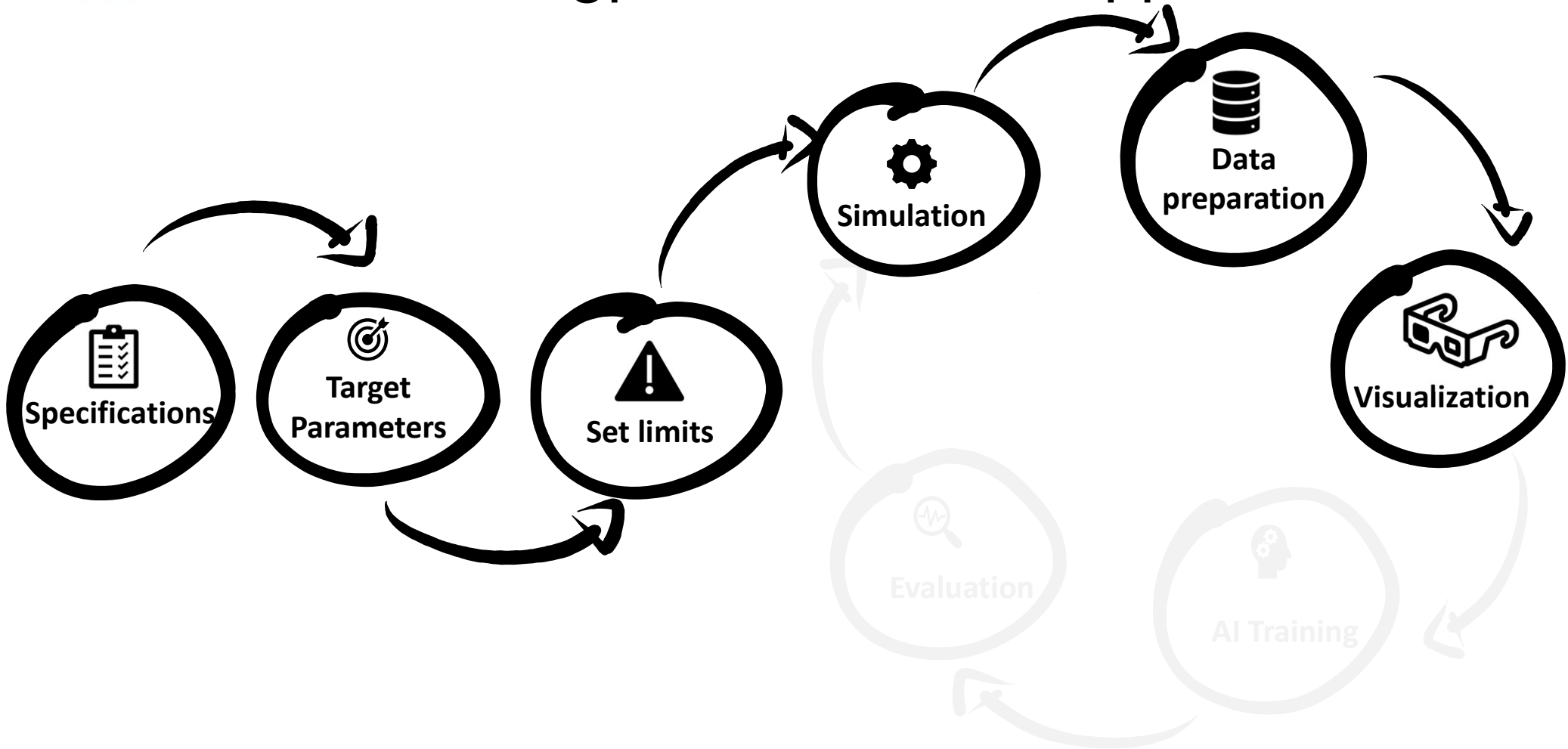


Data transfer to dAlve



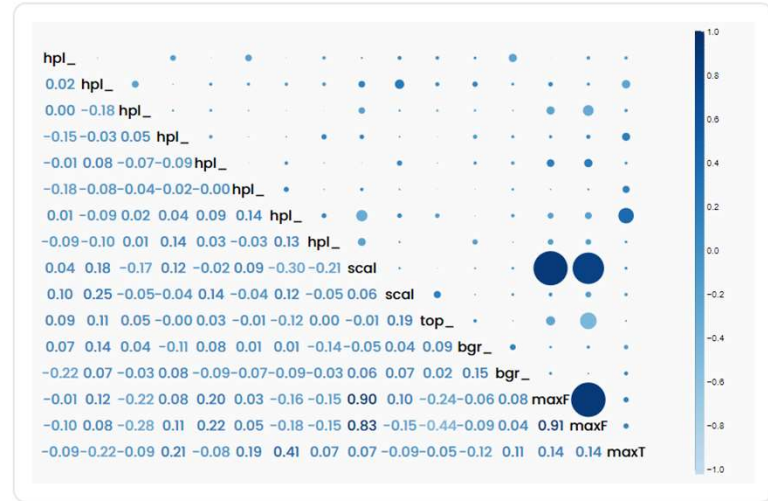
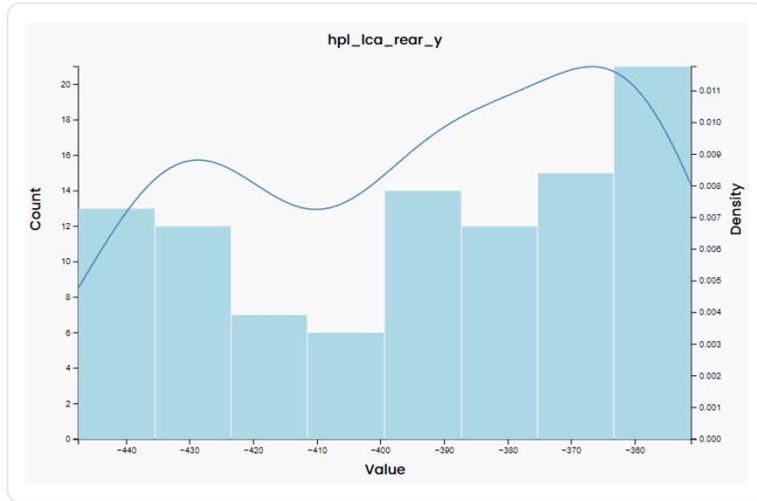


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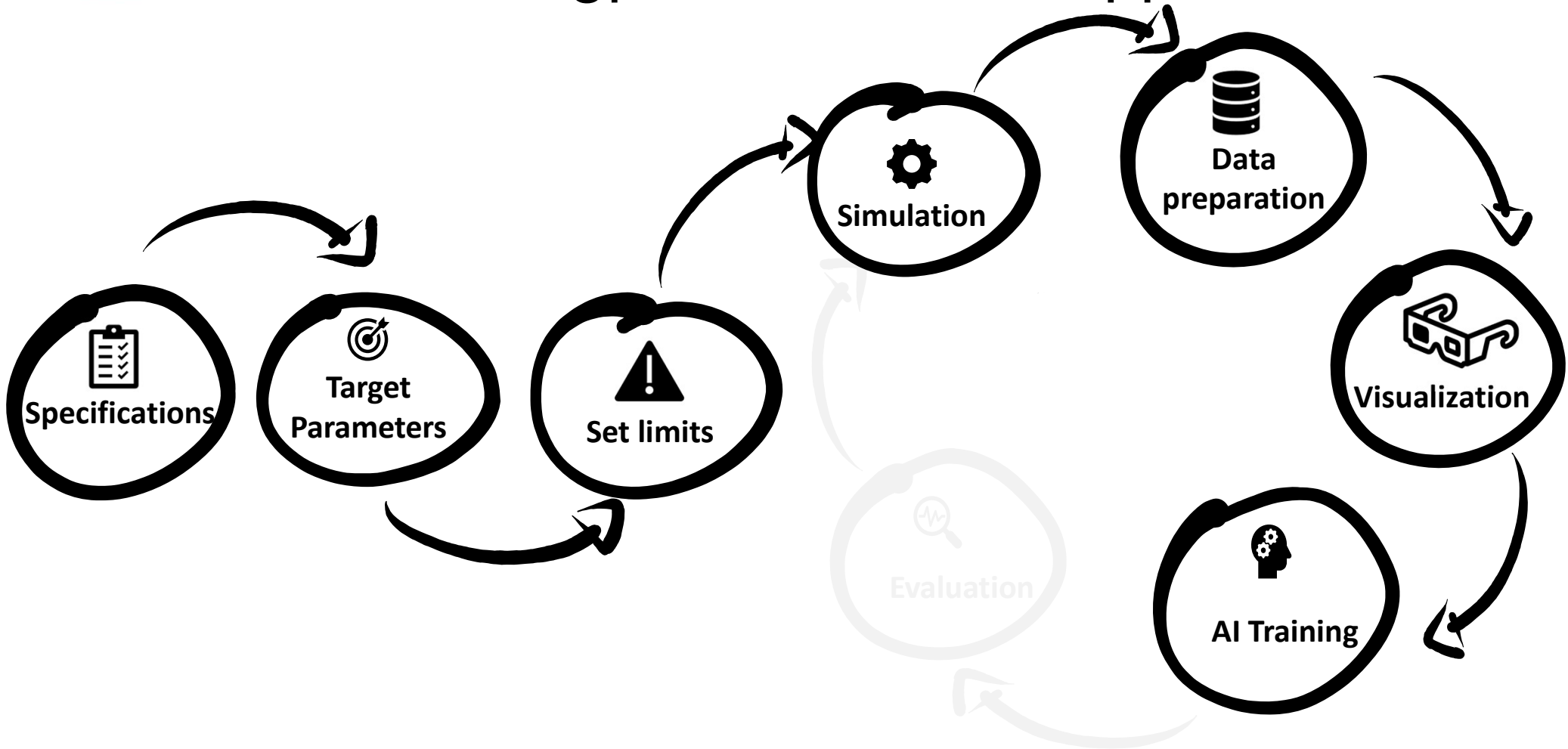


Data Visualization



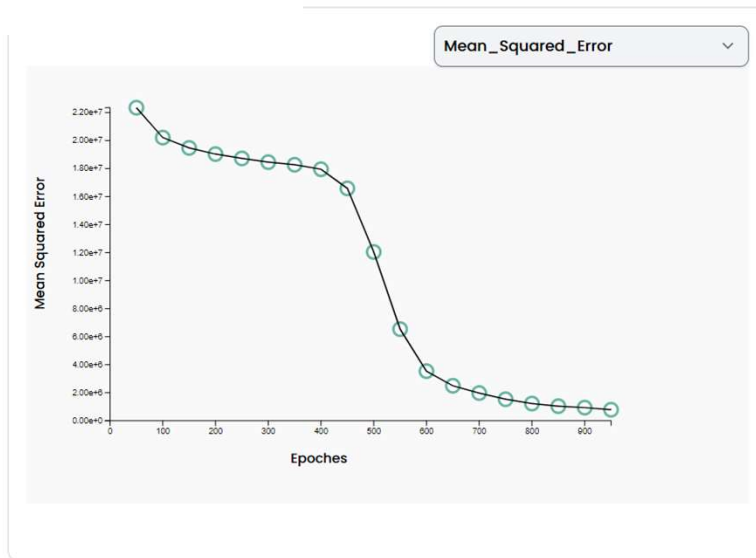


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AI-Training

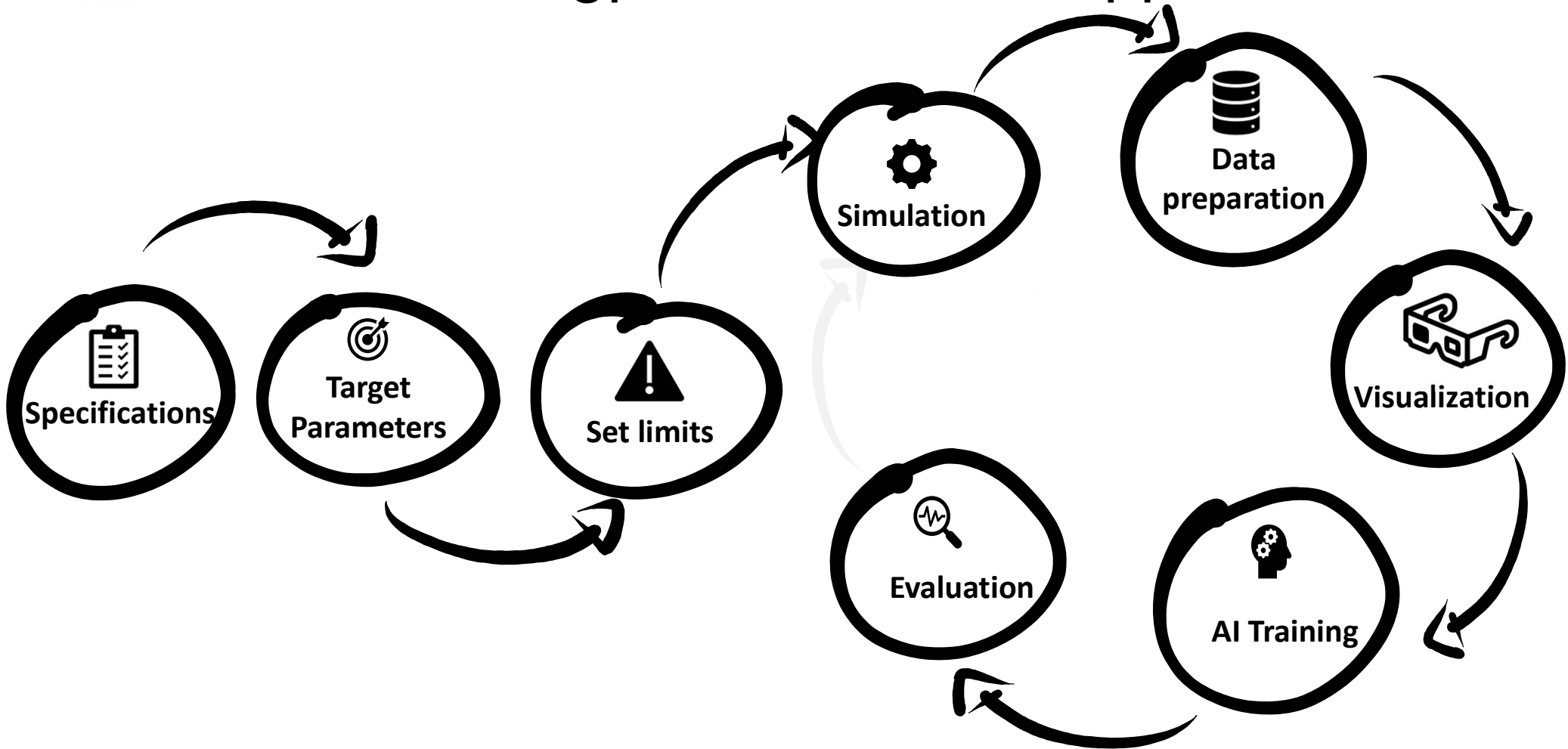


Metrics

Name	Value
Mean Squared Error	782965.813
Mean Absolute Error	656.897
Root Mean Squared Error	884.854
Mean Absolute Percentage Error	2.675



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Evaluation

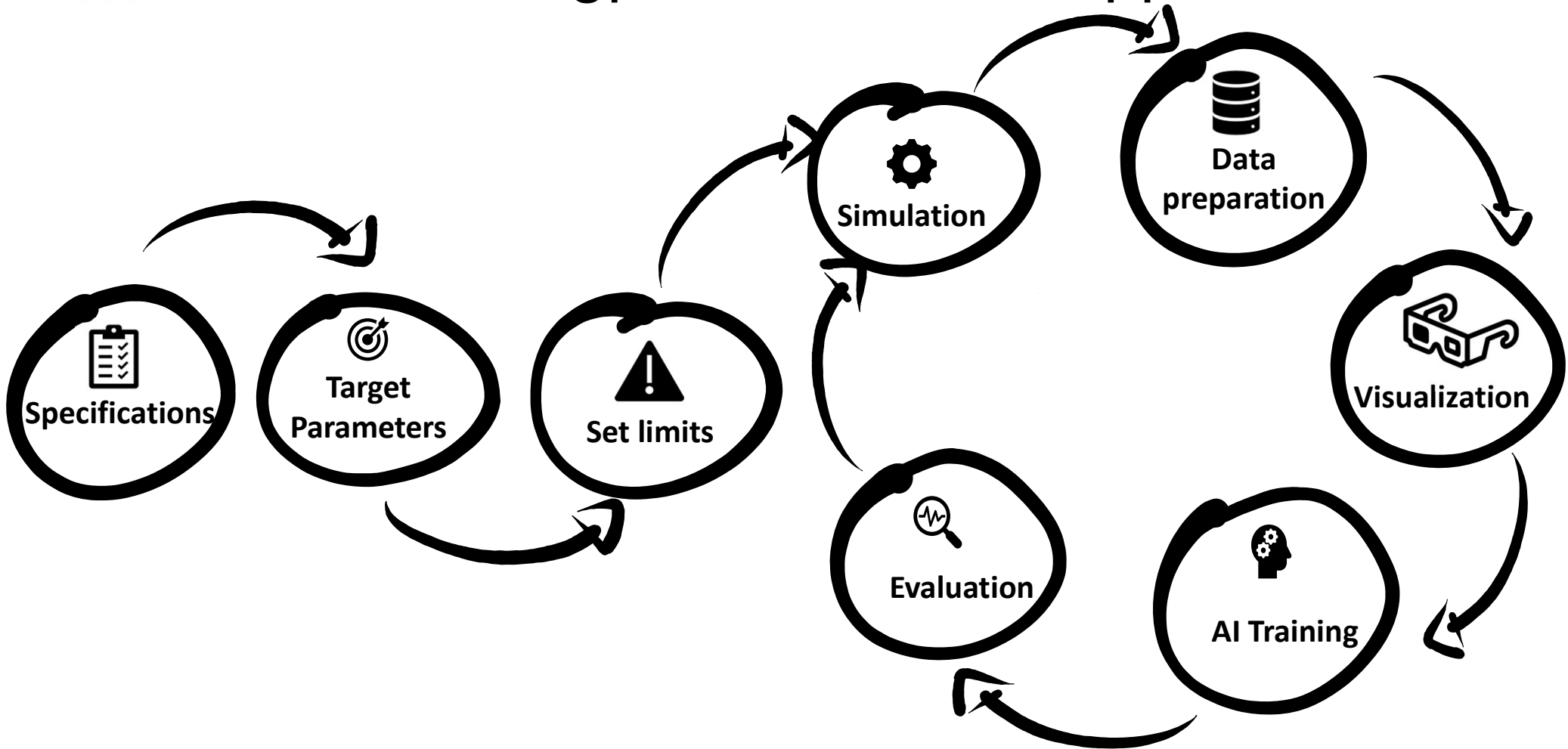
e.g. in



Excel



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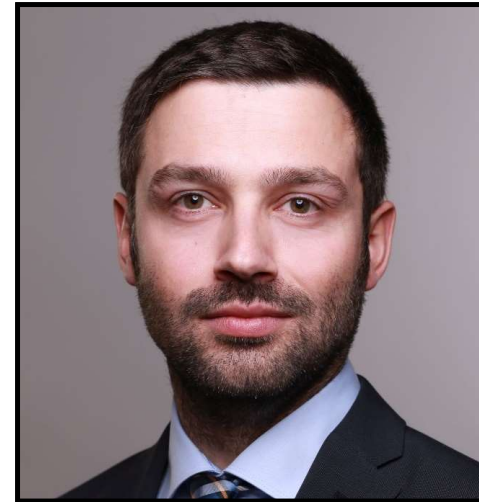




You have questions – we have answers!



Simon Mayer



Alexander Köppe

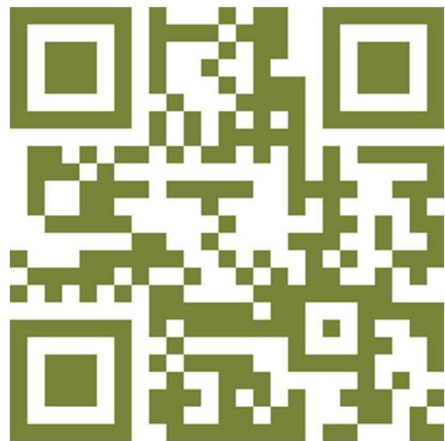




You have questions – we provide answers!

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