

# Investigating the Effectiveness of Machine Learning Paradigms for Supporting Engineering Designers in Rapidly Evolving Digital Manufacturing

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**THRED**



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**ENGINEERING DESIGN, TECHNOLOGY,  
AND PROFESSIONAL PROGRAMS**

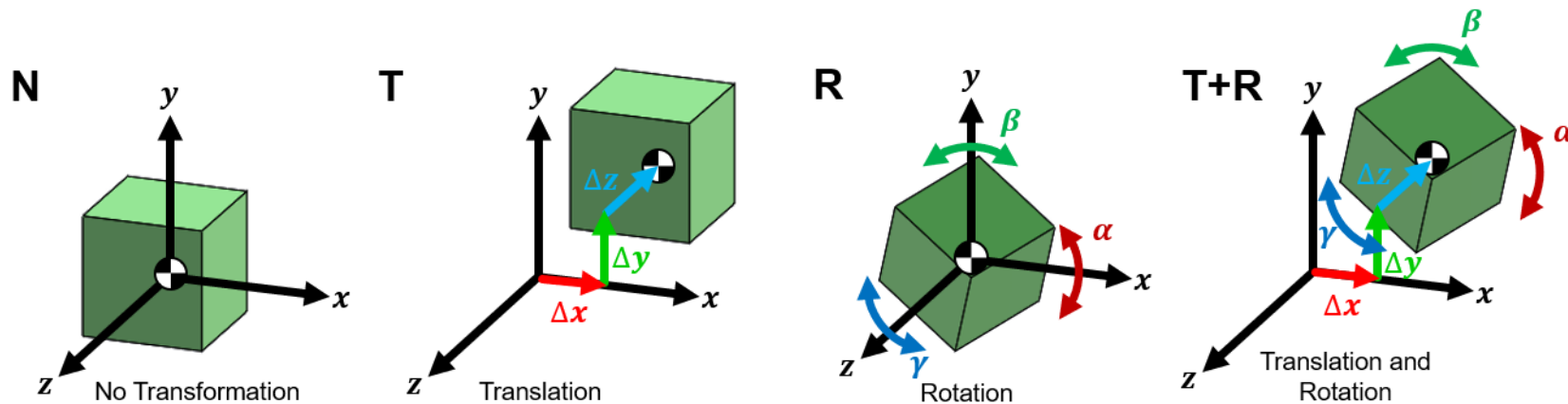
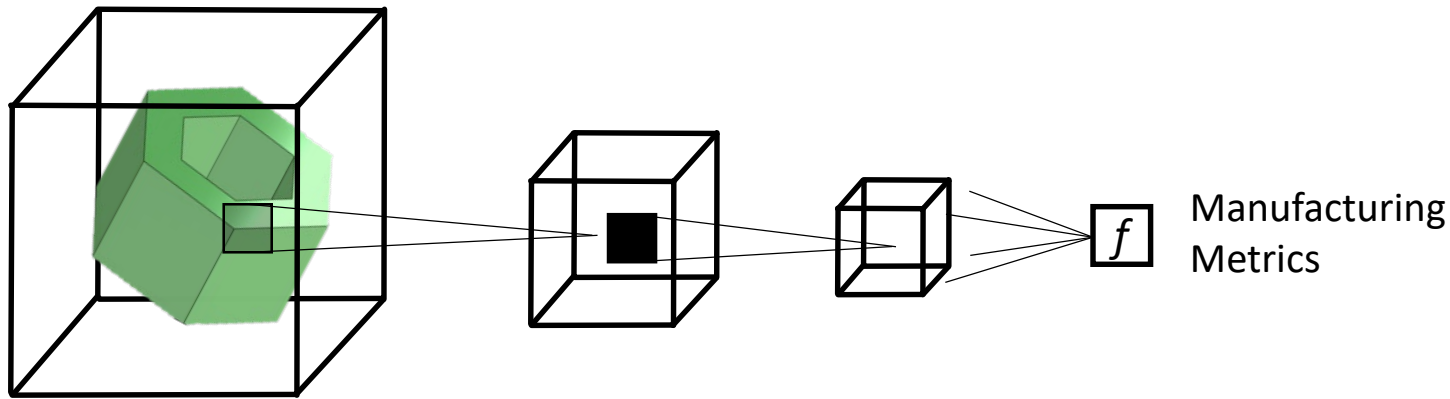
Additive manufacturing is an example of a technology with a large digital footprint.

**Thingiverse**

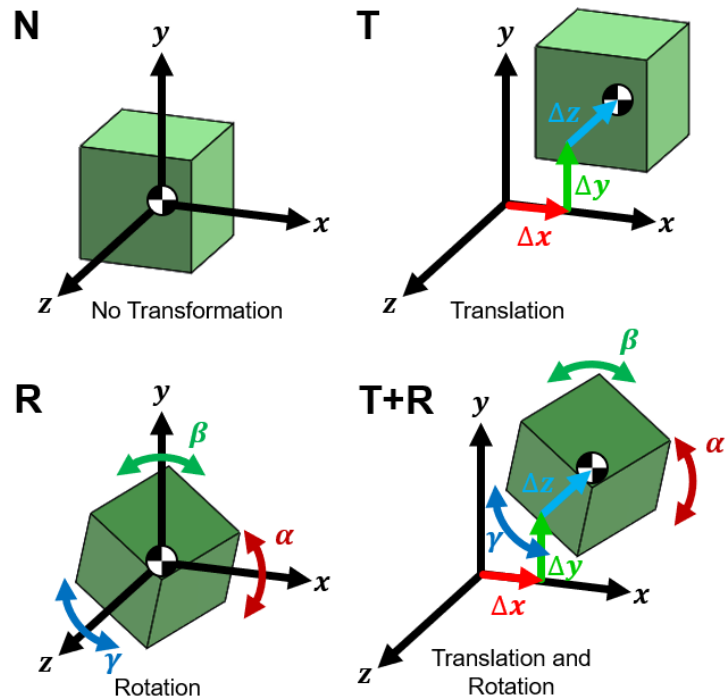
**GRABCAD**

**shapeways** 

Deep neural networks were trained and evaluated on datasets with different treatments.



# Training on data with less standardization yields better accuracy.



**TRAINING TREATMENT**

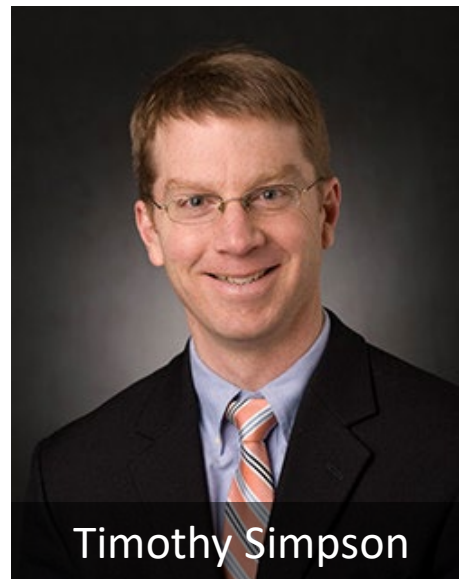
		<b>N</b>	<b>T</b>	<b>R</b>	<b>T+R</b>
<b>PREDICTION TREATMENT</b>	<b>N</b>	<b>0.98</b>	<b>0.98</b>	<b>0.97</b>	<b>0.95</b>
	<b>T</b>	<b>0.91</b>	<b>0.98</b>	<b>0.96</b>	<b>0.97</b>
	<b>R</b>	<b>0.91</b>	<b>0.93</b>	<b>0.98</b>	<b>0.99</b>
	<b>T+R</b>	<b>0.88</b>	<b>0.91</b>	<b>0.96</b>	<b>0.98</b>

1.00

0.88



Glen Williams



Timothy Simpson



Nicholas Meisel