

# Diploma Thesis Assignment

Student: **Avinash Musiri Ramalingam Pillai Baskar**

Study Programme: N2301 Mechanical Engineering

Study Branch: 3901T003 Applied Mechanics

Title: Calibration of Advanced Material Model for 3D Printing Materials using  
Optimization and Machine Learning Methods  
Kalibrace pokročilého materiálového modelu pro materiály 3D tisku s  
využitím optimalizace a metod strojového učení

The thesis language: English

## Description:

- 1) Description of considered 3D print technology
- 2) Design of experiments
- 3) Experiments realization using a suitable optical method
- 4) Finite element model creation
- 5) Machine learning and optimization methods for adjusting material parameters
- 6) Conclusions

## References:

1. J.F. Doyle, Modern Experimental Stress Analysis: completing the solution of partially specified problems, Wiley & Sons, UK, 2004.
2. N.Shahrubudin, T.C.Lee, R.Ramlan. An Overview on 3D Printing Technology: Technological, Materials, and Applications. Procedia Manufacturing, Vol. 35, 2019, Pages 1286-1296.
3. Juergen Schmidhuber, Deep Learning in Neural Networks: An Overview, Neural Networks, Vol. 61, pages 85-117, 2015.
4. Yoshua Bengio, Deep Learning of Representations: Looking Forward, Department of Computer Science and Operations Research, University of Montreal, Canada, 2013. Available at: <http://goo.gl/OK0WV9> .
5. Hastie, T., Tibshirani, R., Friedman, J., The Elements of Statistical Learning: Data Mining, Inference, and Prediction. Second Edition, Springer, February 2009.

Extent and terms of a thesis are specified in directions for its elaboration that are opened to the public on the web sites of the faculty.

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