

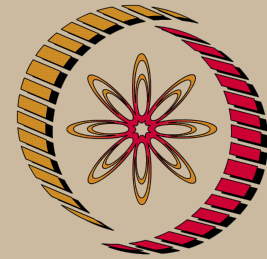
NOC: Digital Human Modeling and Simulation for Virtual Ergonomics Evaluation - Video course

COURSE OUTLINE

It is well known that knowledge of 'Ergonomics/ Human Factors Engineering' is of utmost necessity for any product, facility and workplace design to achieve optimal man-machine compatibility in terms of physical, cognitive and environmental factors. While ergonomics evaluation using physical mockups and prototype with real human trials is tiresome, time-consuming, and costly; virtual ergonomics evaluation using CAD model of human and products/facilities is extremely beneficial to get rid of all these issues. The course 'Digital Human Modeling and Simulation for Virtual Ergonomics' deals not only with the basics of Ergonomics but also covers the all the relevant topics related to virtual ergonomics evaluation techniques including its advantages and limitations.

COURSE DETAIL

Week	Topics
1.	Introduction to ergonomics
2.	Use of percentile anthropometric and biomechanical data for product/ facility design
3.	Virtual ergonomics and its advantages
4.	Introduction of digital human modeling (DHM) and simulation
5.	Techniques/process of virtual ergonomics



NP-TEL

NPTEL

<http://nptel.ac.in>

Humanities and Social Sciences

Pre-requisites:

Knowledge and expertise in using CAD software for 3D modeling

Coordinators:

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	evaluation using DHMs
6.	Techniques/process of virtual ergonomics evaluation using DHMs
7.	Application of digital human modeling and simulation in various industrial sectors
8.	Future research avenues and steps to be taken towards widespread use of DHMs in industrial sectors and research organizations of developing countries

References:

1. Badler, N., 1993. Computer Graphics Animation and Control, in *Simulating Humans*. New York: Oxford University Press.
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3. Duffy V.G., 2010. *Advances in Applied Digital Human Modeling*. CRC Press, USA.
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5. Duffy V.G., 2015. *Digital Human Modeling. Applications in Health, Safety, Ergonomics and Risk Management: Ergonomics and Health*. LNCS: 9184-9185, Springer International Publishing, USA.
6. Karmakar, S., Pal, M. S., Majumdar, Deepti. and Majumdar, D., 2012. Application of Digital Human Modeling and Simulation for Vision Analysis of Pilots in a Jet Aircraft: A Case Study. *Work*. IOS Press, 41 Suppl. 1, 3412-3418.
7. Karmakar, S., Sanjog, J. and Patel, T., 2014. Digital Human Modeling and Simulation in Product and Workplace Design: Indian Scenario. *International Journal of Engineering Research and Applications (IJERA)*, Special issue. Pp. 06-12.
8. Patel, T., Sanjog, J., Chowdhury, A., and Karmakar, S., 2013. Applications of DHM in Agricultural Engineering: A Review. *Advanced Engineering Forum*, 10, 16-21.
9. Sundin, A. and Jorgensen, R., 2006. Digital human modeling for CAE applications. In: G. Salvendy, eds. *Handbook of Human Factors and Ergonomics*. 3rd ed. 1053-1078.
10. Sanjog, J., Karmakar, S., Patel, T. and Chowdhury, A., 2015. Towards virtual ergonomics: aviation and aerospace. *Aircraft Engineering and Aerospace Technology: An International Journal*, Vol. 87 (3), 266 – 273.

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