Computational Design for AI in Manufacturing – LIVE VIRTUAL COURSE

July 13-17, 2020

Course Schedule

Day 1
• Morning: 9 am – 12 pm
  – Computational design and manufacturing workflow
  – Overview of advanced manufacturing processes
• Afternoon: 1 pm – 5 pm
  – Solid modeling and design representations
  – From geometry to hardware abstraction languages
  – Lab 1: Designing and printing models using a virtualized 3D printer

Day 2
• Morning: 9 am – 12 pm
  – Parametric modeling and CAD
  – Procedural modeling
  – Deformation methods
• Afternoon: 1 pm – 5 pm
  – Lab 2: Designing parametric models for additive manufacturing
  – Computer simulation and virtual testing
  – Lab 3: Predicting design performance for additive manufacturing

Day 3
• Morning: 9 am – 12 pm
  – Inverse methods and performance-driven design
  – Introduction to optimization
  – Topology optimization
• Afternoon: 1 pm – 5 pm
  – Optimizing design for multiple objectives
– Performance space representations
– Lab 4: Design for AM using topology optimization

Day 4
• Morning: 9 am – 12 pm
  – Interactive design applications
  – Integrated design tools for domain-specific applications
  – Introduction to AI and machine learning
• Afternoon: 1 pm – 5 pm
  – Symbolic AI methods
  – Machine learning methods
  – Lab 5: Designing and building a machine learning model

Day 5
• Morning: 9 am – 12 pm
  – Advanced AI tools for design customization
  – Lab 6: Data-driven models for design customization
• Afternoon: 1 pm – 5 pm
  – Data-driven systems for computational design
  – Automated discovery of optimal designs
  – Intelligent manufacturing systems
  – Course review: developing an end-to-end computational design and manufacturing workflow