



# Application Story

CORNELL UNIVERSITY BRINGS PIECES OF HISTORY BACK TO LIFE

*“The Dimension 3D Printer allows users to step beyond the virtual barriers and gives students the opportunity to interact with these pieces of history.”*

*– Hod Lipson, Assistant Professor Mechanical & Aerospace Engineering, Cornell University*

## CASE STUDY



Visitors to Cornell University's online digital library and museum of kinematic mechanisms are beginning to discover its exhibits of more than 300 historical models of 19th century machines. Cornell University's Sibley School of Mechanical and Aerospace Engineering owns the largest set of Franz Reueaux's kinematic mechanisms in the world. The school acquired these cast iron and brass models in 1862 and has them on display throughout the department.

## Kinematic Models for Design Digital Library

In a collaborative effort and supported by funds from the National Science Foundation as a National Science Digital Library (<http://nsdl.org>) collection and also funds from the Institute for Museum and Library Services (<http://www.ims.gov>), Cornell University faculty and librarians developed The Kinematic Models for Design Digital Library (K-MODDL), which is an open access, multimedia resource for learning and teaching about kinematics - the geometry of pure motion - and the history and theory of machines. The K-MODDL team is using a Dimension 3D Printer to reproduce physical models from digital files. STL files for several models are available for download at the K-MODDL web site (<http://kmoddl.library.cornell.edu>), allowing users with access to a 3D Printer to download, print, and interact with their own fully functional physical replicas.

## Learning with Dimension

With a Dimension 3D Printer in the classroom, Cornell has the ability to print functional, working kinematic models in durable ABS plastic. These physical replicas of the originals are ideal for student interaction. Rather than just seeing virtual models or watching movies online, students ANYWHERE with a 3D printer, can now also touch and experience these models directly and get a true sense of how they function.

“Without a physical embodiment, one cannot appreciate the friction, dynamics and tolerances of these models,” said Hod Lipson, Asst. Professor of Mechanical and Aerospace Engineering at Cornell University. “Students are amazed by the capabilities of the Dimension 3D Printer. When a student sees the printer in action for the first time - they just can’t believe what they are seeing,” Lipson continued.

## Creating an advantage for students and schools.

Dimension 3D Printers provide an affordable, easy to use, easy to maintain, one-step process for students and instructors to explore concepts in durable ABS plastic. Dimension 3D Printers are helping high schools, technical colleges and universities extend their science, CAD and machine tool curriculums by enabling students to build functional models and see their ideas firsthand.

Innovative designers, engineers, architects and manufacturers consider prototyping a critical step of the design process. As the use of CAD and 3D printing increases throughout the design process, understanding this technology is critical for design students. With a Dimension 3D Printer, students and educators can easily bring design ideas to life in ABS plastic - right from a CAD file.



The Dimension 3D Printer is reproducing accurate historical kinematic models as tools for both teaching and artifact conservancy.

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