
Mechanisms in Minnesota

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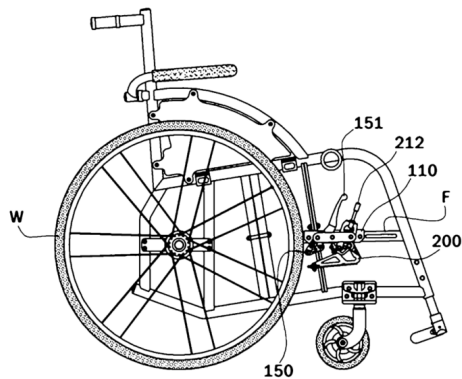


Mechanisms Move Our World

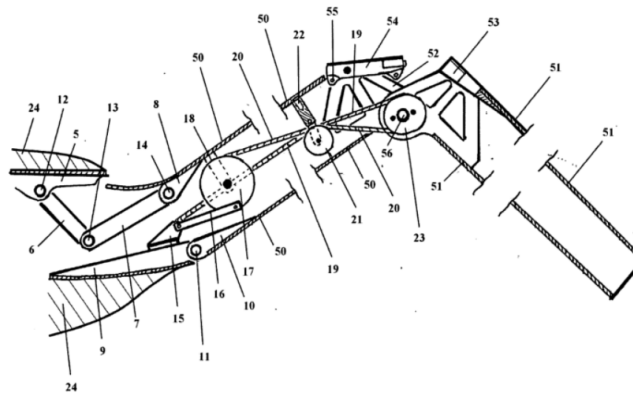
Mechanisms are mechanical devices that transfer **Force** and **Motion** from a **Source** to an **Output**.

During this course, students will

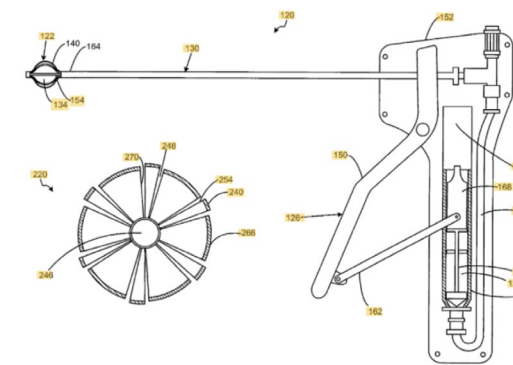
- Learn introductory kinematic analysis and synthesis theory in a design context,
- Apply graphical and analytical methods to analyze and design mechanisms to create arbitrary motion,
- Use software tools for detailed linkage synthesis, and
- Design and construct a working mechanism in small teams.



Wheelchair Brake Unit
WO2018212492A1



**Folding wing and
locking mechanism**
US20100051742A1



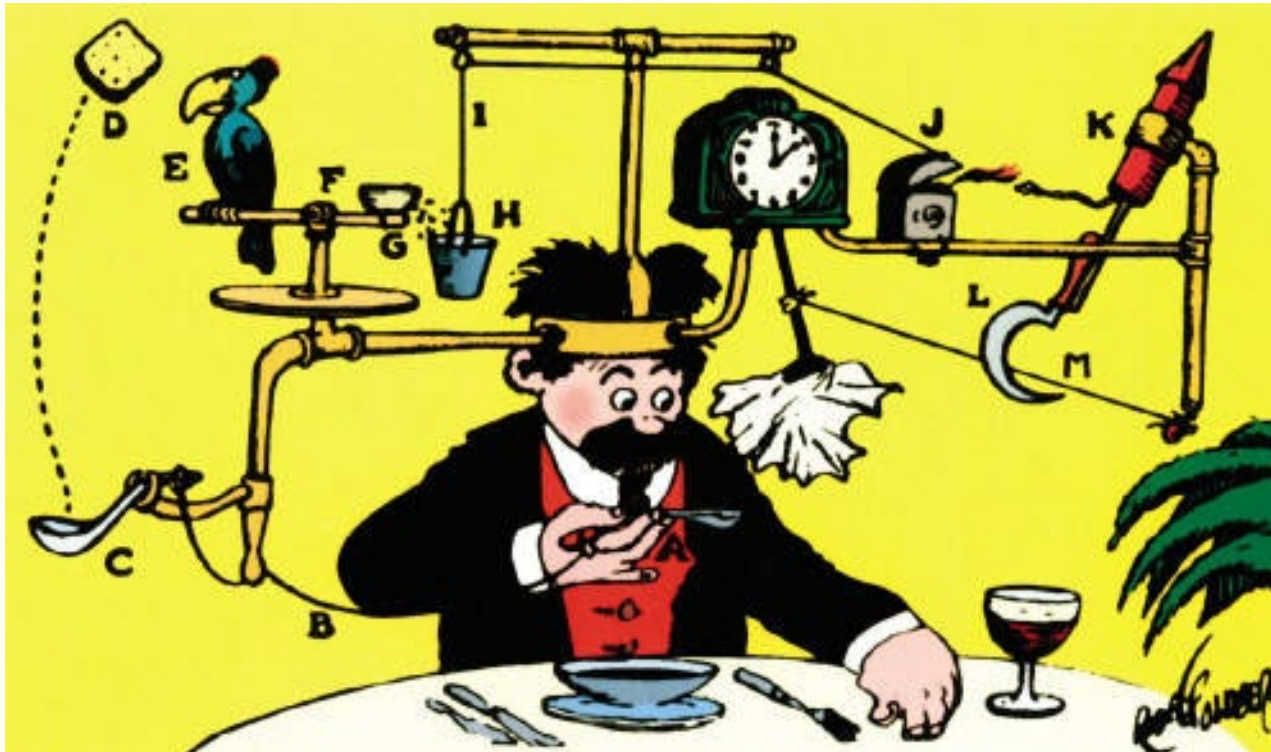
**Medical device with dual
expansion mechanism**
US9089347B2

Project: Collaborative Rube Goldberg-like Machine

You will use the technical skills you learn to design and build a Rube Goldberg-like machine

Rube Goldberg machines are machines that rely on chain reactions to complete a simple task

The techniques you use to create these silly machines are the same as the techniques you would use for product design or repetitive manufacturing tooling



“Professor Butts and the Self-Operating Napkin (1931). Soup spoon (A) is raised to mouth, pulling string (B) and thereby jerking ladle (C), which throws cracker (D) past toucan (E). Toucan jumps after cracker and perch (F) tilts, upsetting seeds (G) into pail (H). Extra weight in pail pulls cord (I), which opens and ignites lighter (J), setting off skyrocket (K), which causes sickle (L) to cut string (M), allowing pendulum with attached napkin to swing back and forth, thereby wiping chin.”
Wikipedia

Project Specifics

Teams of 3-4 students will design and build a linkage mechanism

Team A's linkage must carry an object through several randomly generated points in space

Once Team A's linkage has carried the object through all the defined points, it must pass the object to Team B

Team B's linkage must carry the object through a different set of several randomly generated points in space before passing it to the next team

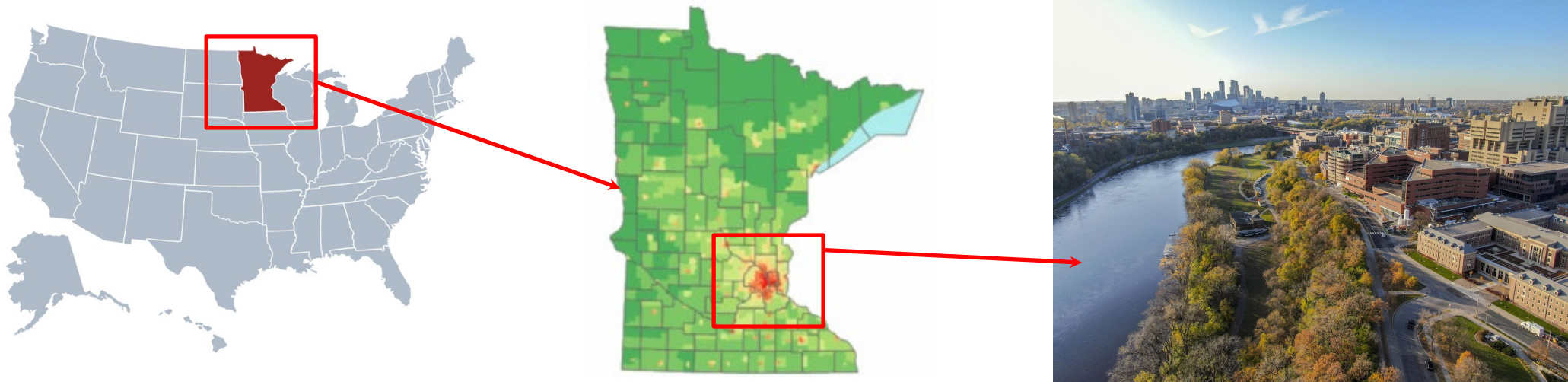
You will use the Anderson Design Lab and Polaris Machine Shop to create your linkage mechanism



Visit Contents

During your visit, you will

- Attend lectures
- Tour University of Minnesota research facilities
- Visit a local Minnesota company (17 Fortune 500 Companies)
- Build a collaborative Rube Goldberg-like machine
- Explore the Twin Cities (award-winning parks, bike trails, and culture)
- Take a short trip outside the Cities



Department of Mechanical Engineering

University of Minnesota



About the University of Minnesota



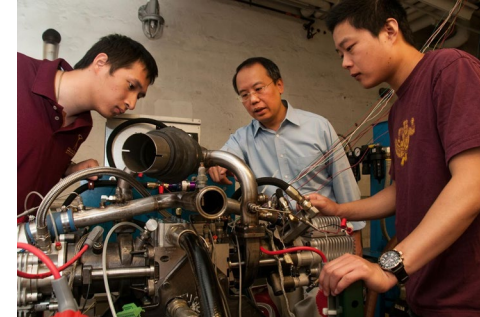
About ME

National Research Centers

Advanced Technologies for the
Preservation of Biological Systems
(ATP Bio)

Center for Compact and Efficient
Fluid Power (CCEFP)

Bakken Medical Devices Center
Center for Transportation Studies



About ME

Unique Relationships and Resources

Medical devices

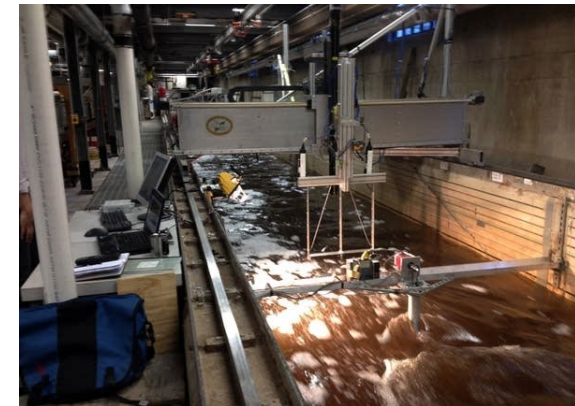
- Major medical device companies
- UMN hospital
- Medical Devices Center
- Mayo Clinic

Saint Anthony Falls Laboratory

Murphy Engines Laboratory

Anderson Labs

Minnesota Supercomputing Institute



Impact Areas

Our Department focuses on leading the future by driving innovative research in five major impact areas:

ENERGY TRANSITION

ENVIRONMENT & SUSTAINABILITY

HUMAN HEALTH

NEXT-GEN MANUFACTURING

ROBOTICS & MOBILITY

