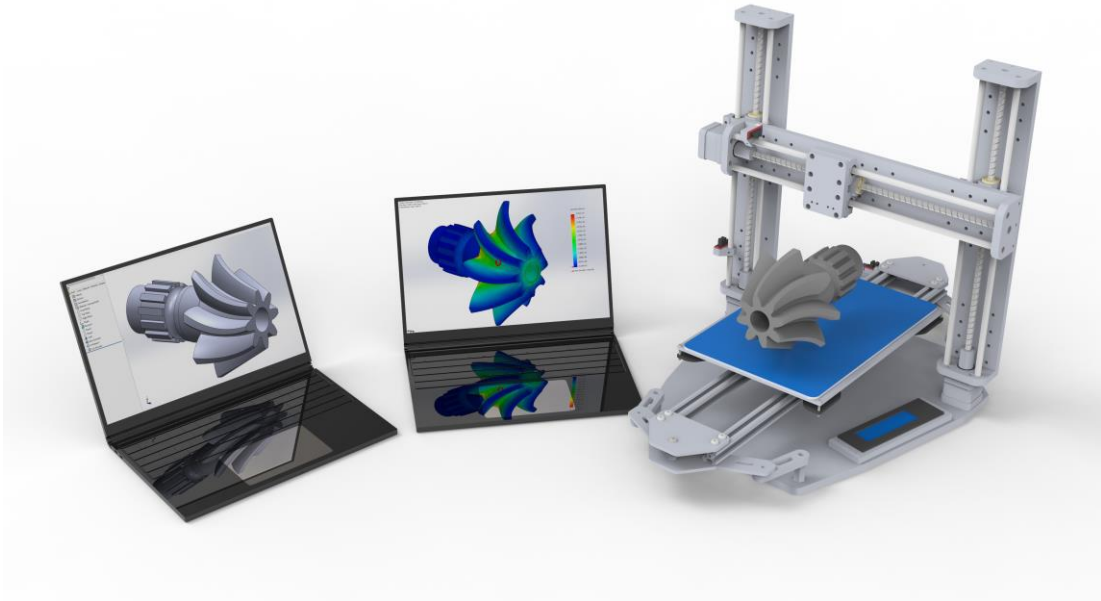
# Parallel Pipes

Intelligently Designed Physical Products

Steve Karasek

steve@parallelpipes.com

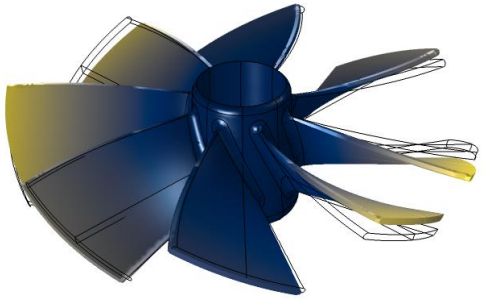


# Parallel Pipes

Intelligently Designed Physical Products

→ Product development is **costly** & **time-consuming**

→ Finding the right **experience** is difficult



**Our AI accelerates your design projects**, from concept to manufacturing:

- **Cut** project **time & cost** by **75%**
- **Automate** virtual testing and prototyping
- Analyze & Optimize in **minutes, not weeks**

# About Me

**Stephen Karasek**
***Founder & CEO***

## Industry Experience

- 12+ years simulation & engineering design,
  in medical device, defense and computational software
- 6+ years Machine Learning & AI
- Project, Task & Group lead roles
- (patent pending) for NN error propagation

## Education

- MSEE & BSEE, Northeastern University

# Founding Team & Advisors

## Scott Frasso

***Principal Software Engineer***

- 15+ years software engineering, management
- 5+ years engineering design
- BSCE, Northeastern University

## Cai Gao

***Software Engineer, Product Owner***

- 8+ years software engineering, management
- 6+ years project management & consulting
- BS Finance, Northeastern University

## Scott Harris

***Advisor***

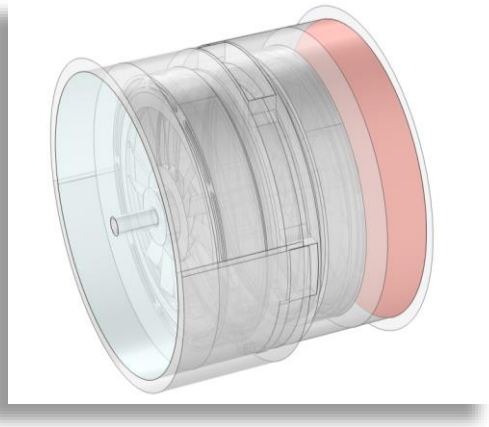
- 20+ years executive leadership (CAD & CAE)
- Serial entrepreneur with two successful exits

Co-founder, Vice President (Onshape)

Co-founder, Vice President (SolidWorks)

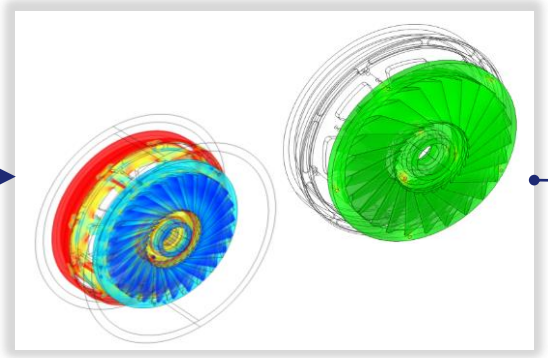
Distinguished Visiting Engineer, Partner for Engineering & Entrepreneurship, (Olin College)

# User Story: WrightOne (Electric Turbine)



Analysis

***1 day*** *(vs 2 months)*
***$1,000*** *(vs >$24,000)*



**Purchase Order:**

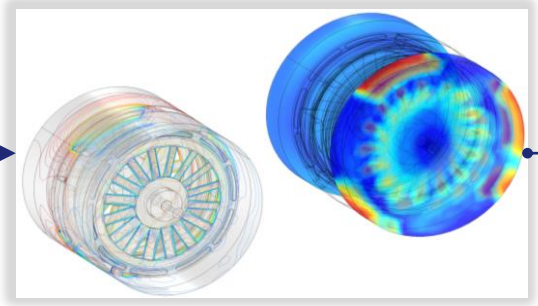
x 2,000 units

**New Product:**

Design Changes & Alterations

Optimization

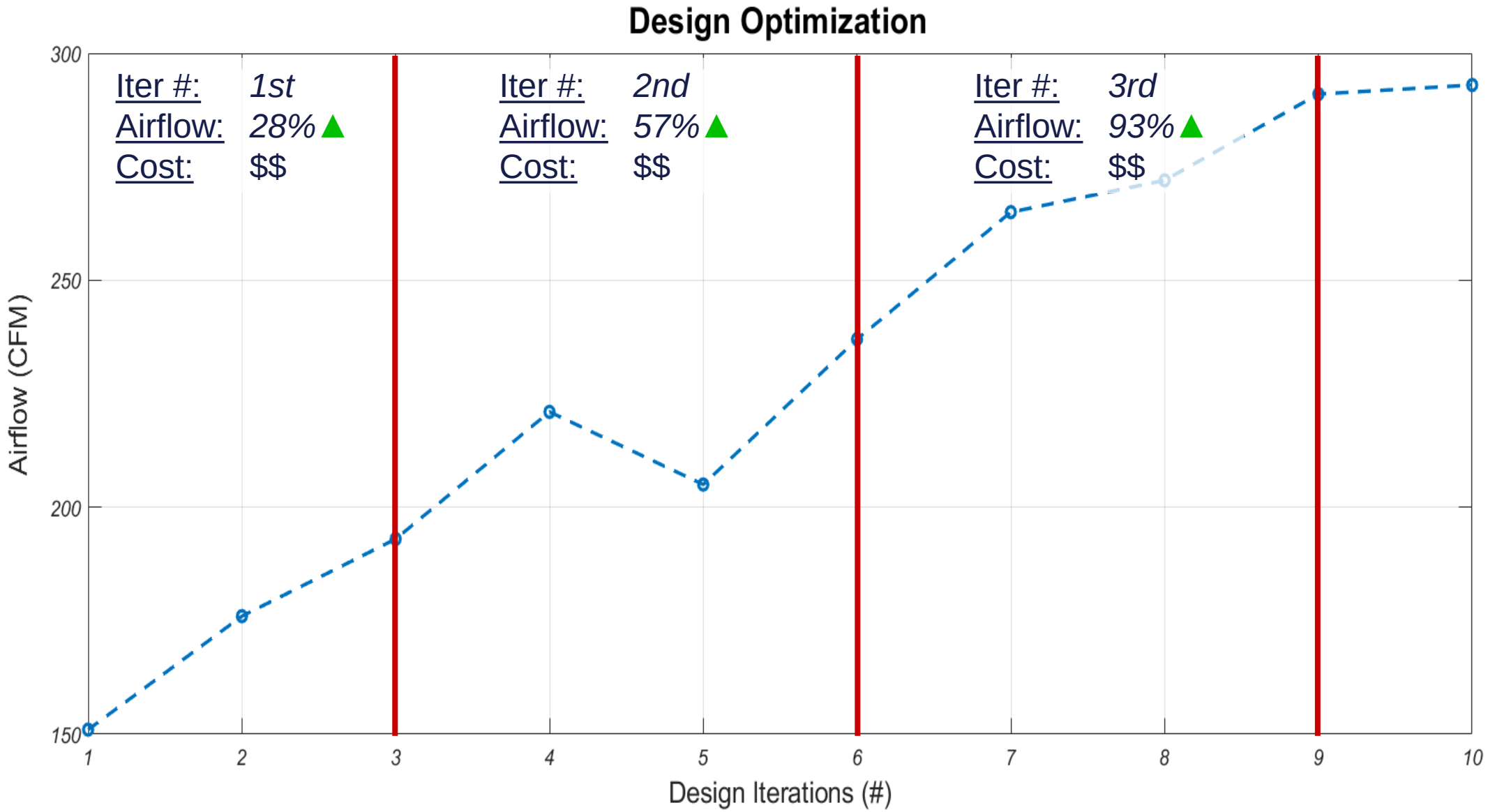
***2 weeks*** *(vs 4 months)*
***$10,000*** *(vs >$60,000)*



**Prototype Tested:**

Ready for Manufacturing

# User Story: WrightOne (Electric Turbine)



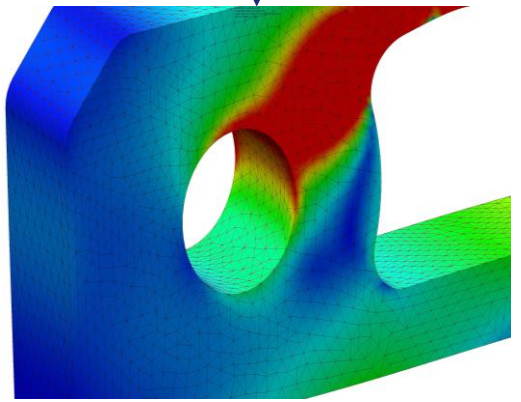
# Engineering Software

## Computer Aided Design (CAD)

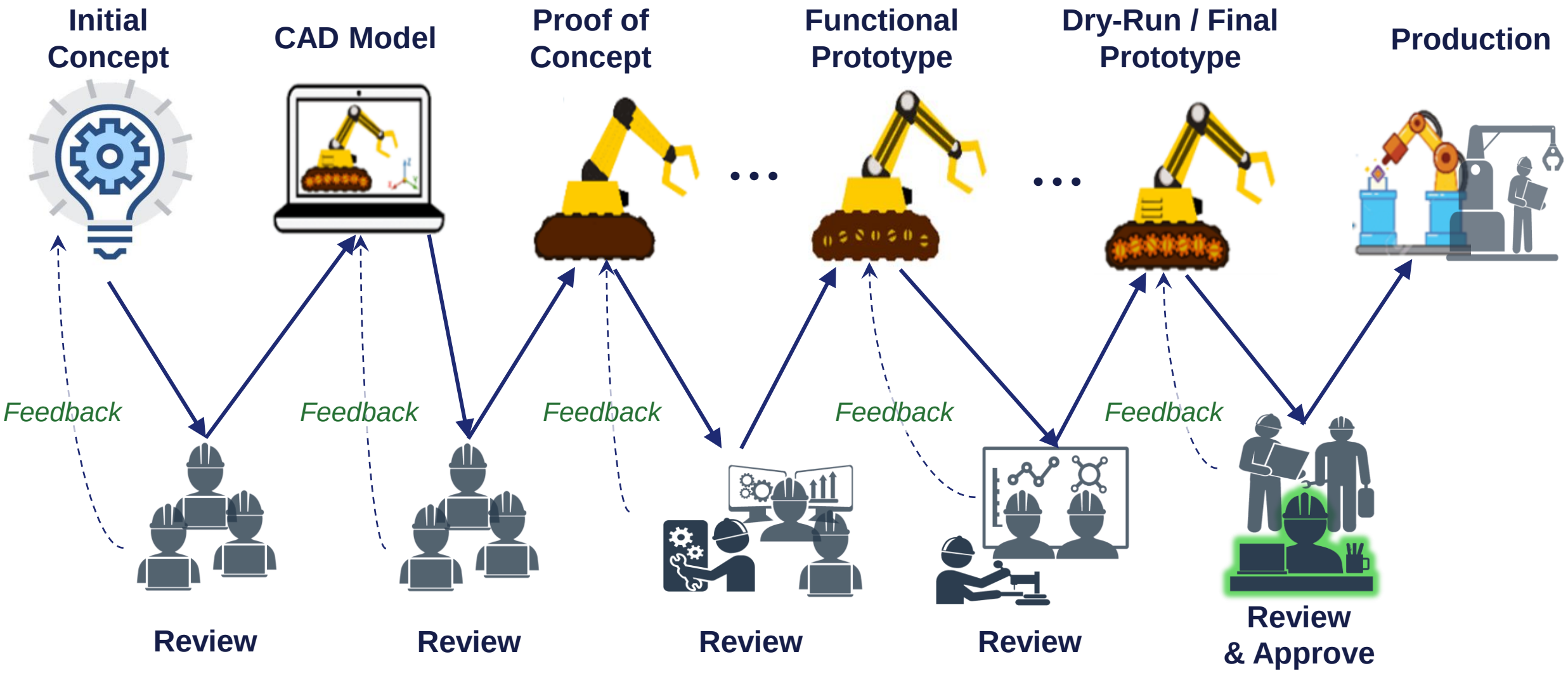
- **Accurate** models
- **Training** (3 – 5 years)
- **Easier** to manufacture
- **Expensive** computers*

## Simulation & Computer Aided Engineering (CAE)

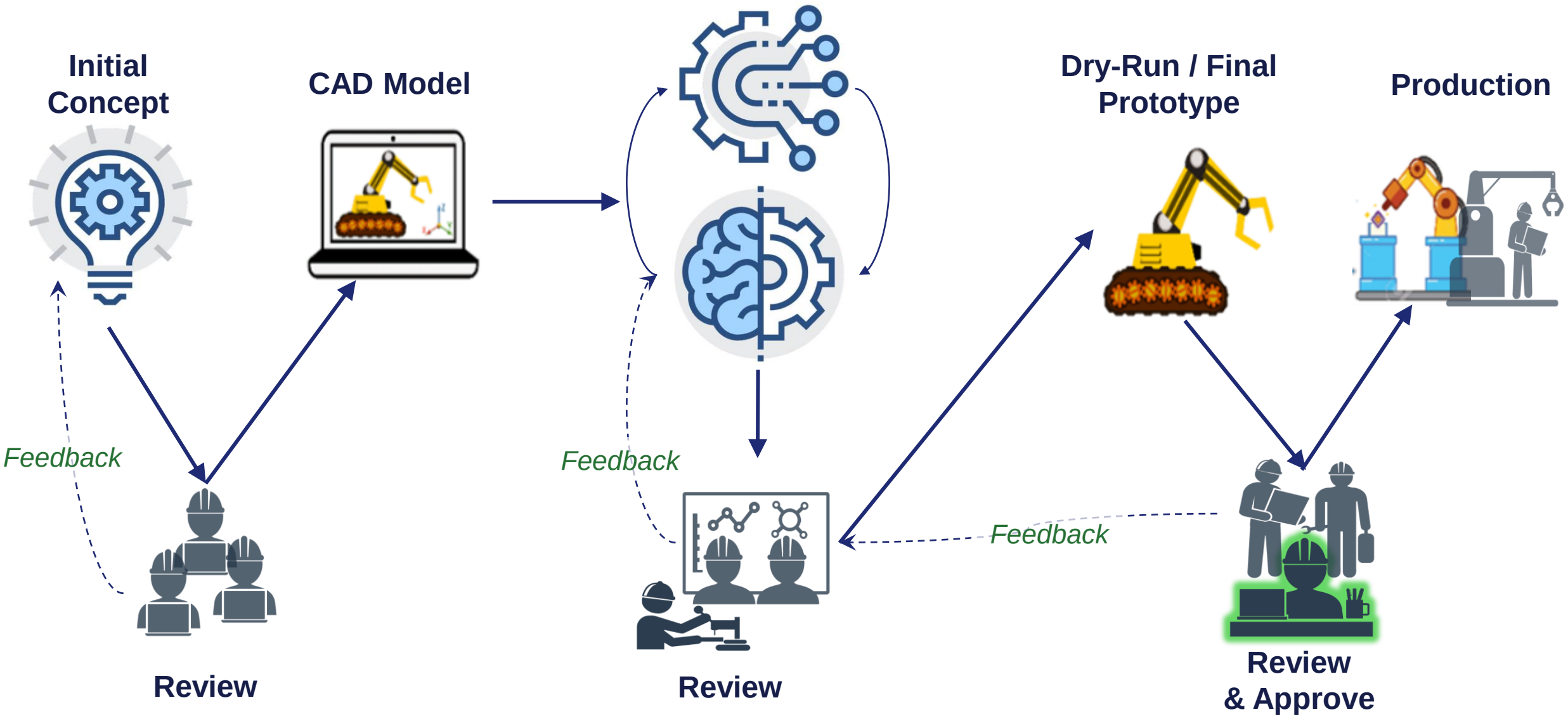
- **Analytics** for Physics
- **Training** (5 – 10 years)
- **Maintenance** & support staff
- **Test** & **analyze** (without breaking)
- **Very expensive** computers*



# Design Cycle (CAD, Simulation & CAM)

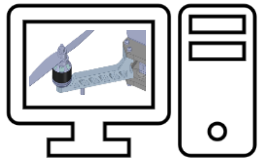


# Design Cycle (Automated CAE)

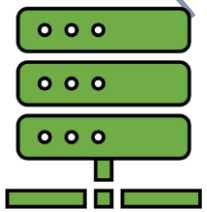


# How it Works

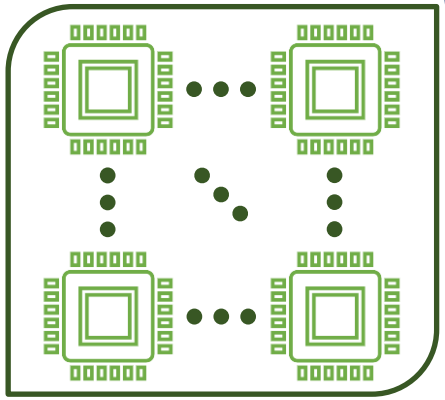
Upload CAD files, Define Goals



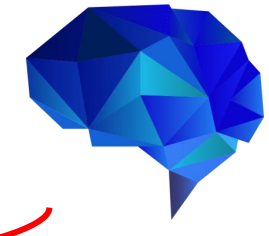
Submit for Optimization



App



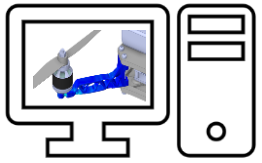
Simulation Environment



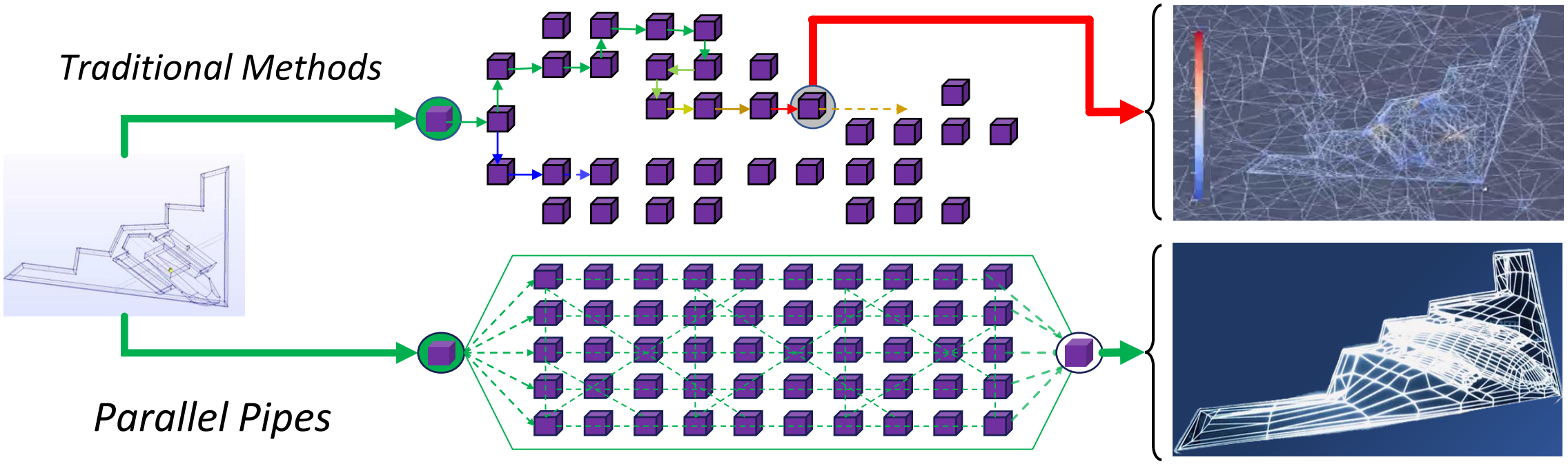
AI

View Updates, Download Results

Customer Success!



# Parallel Design Paths




## Machine Intelligence

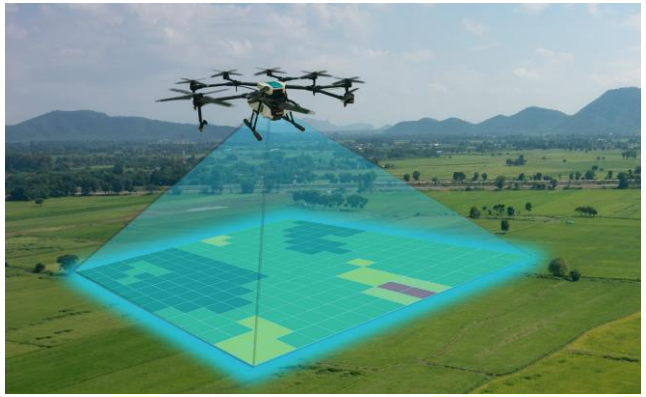
- *Greater Accuracy = accelerated solution*
- *AI/ML have advanced enough for practical use*

## Scalable Solution

- *Continually expanding dataset to train AI*
- *Cloud-based platform empowers us to tackle any size customer challenge*

# Who we can help

**Ideal Size**: - Small-to-Medium Companies
(& Funded Startups)
- Small teams in Large Companies



**Verticals**: - Robotics & Drones,
safety equipment,

*Robotics & Drones share similar design workflows*

**Focus**: - Product Development
- Outsource Design shop
- Engineering consulting

# Success Stories with Parallel Pipes

Wright One

Using Parallel Pipes means **we are no longer taking risks with our development.** Our newfound insights helped gain both customers and investors.

*Justin McAfee*
*CEO, WrightOne Inc.*

Hopper Express

Parallel pipes helped us **see how well our vehicle would fly before we built our first prototype.** Within hours we were able to see results from our first analysis.

*Tom Daily*
*CEO, Hopper Express*

With Parallel Pipes we **understood how to best improve our robots.** The platform gave our engineers clarity, and was **easier to use** compared to other software.

*Pranav Srinivasan*
*CTO, Accio Robotics LLC*

VOID
— ROBOTICS —

Parallel Pipes gave us **visibility we couldn't have predicted ourselves**. The analysis we directly led to our **robot's increased lifespan**.

*Nithin Das*
*Principal Mechanical Engineer, Void Robotics LLC*

# Let’s design smarter AND faster, together

*Sign up today & try for free!*

**Parallel Pipes**

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steve@parallelpipes.com

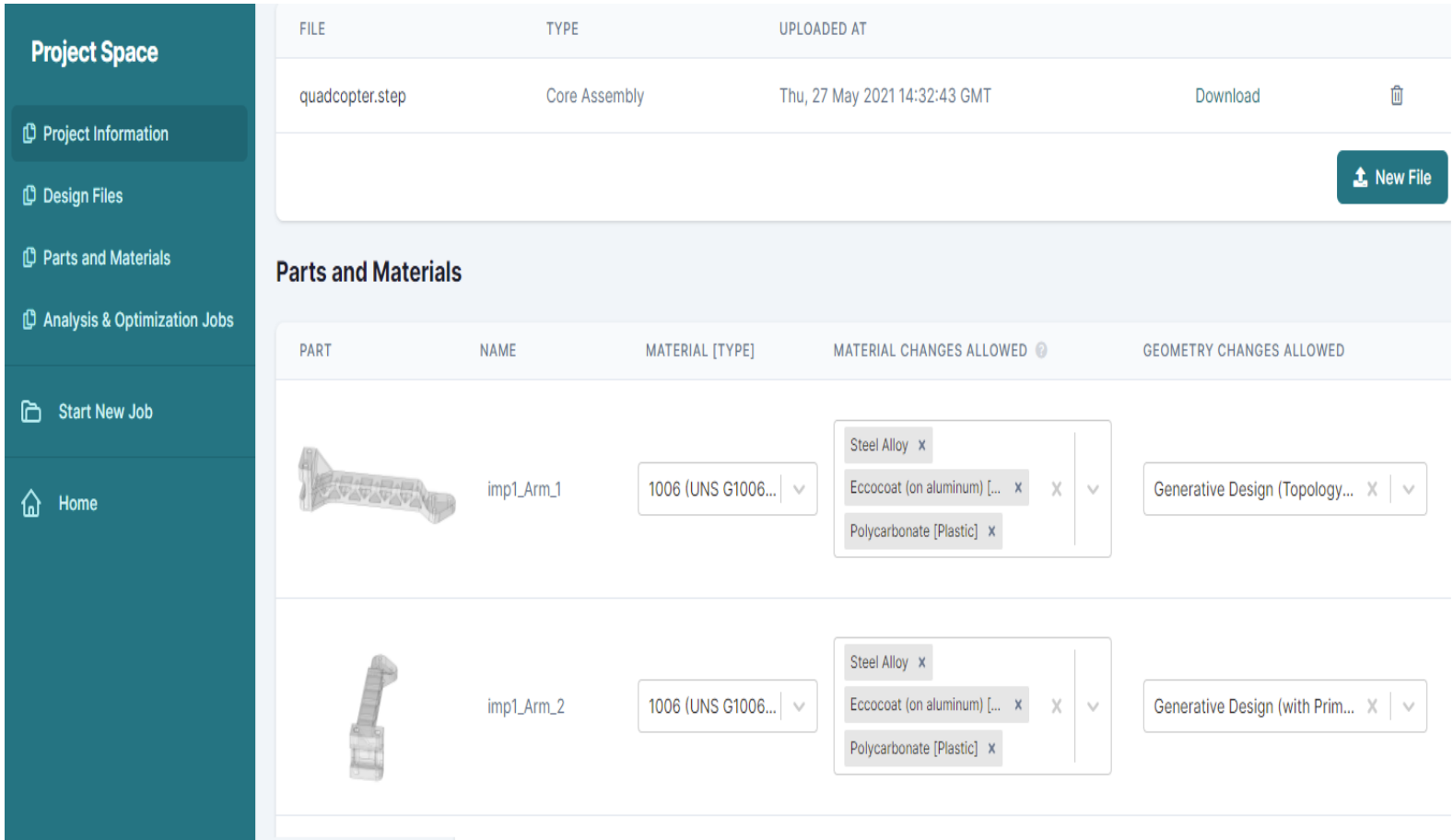
# Automated Design Workflow

**We are the first automated, AI-powered solution that eliminates time-consuming steps in engineering workflows**

**(1) Upload CAD model & BoM**
(Bill of Materials)

**(2) Define materials for parts**
(if no materials found)

**(3) Define allowable changes to each part**
(material & Geometry)

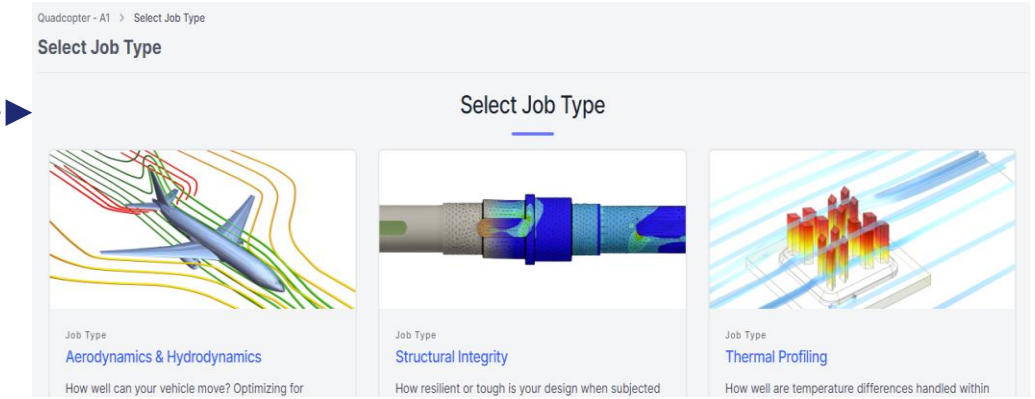


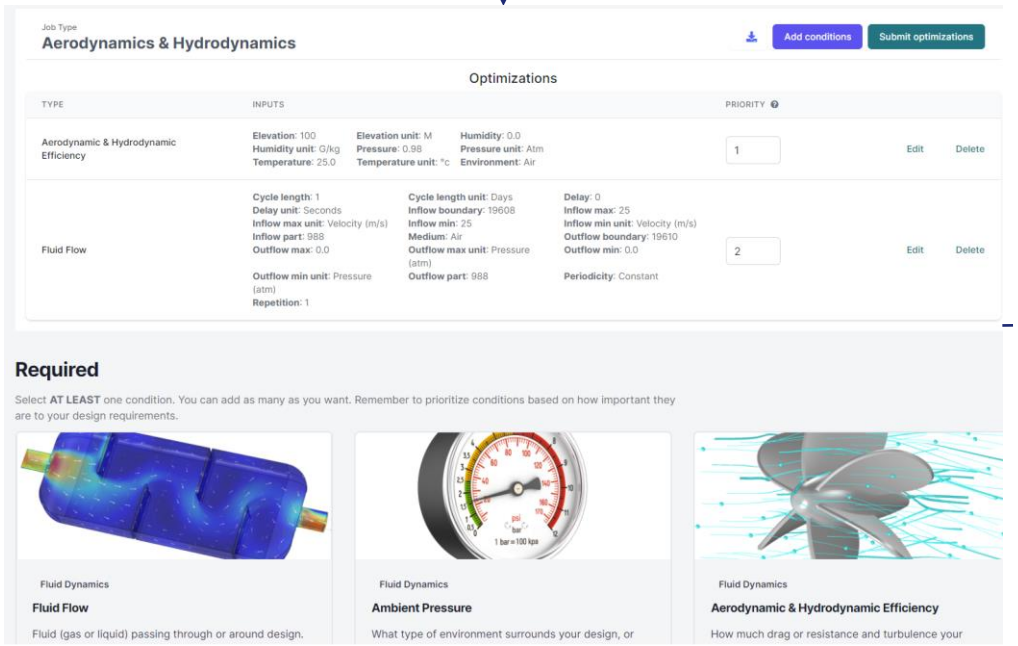
# Automated Design Workflow

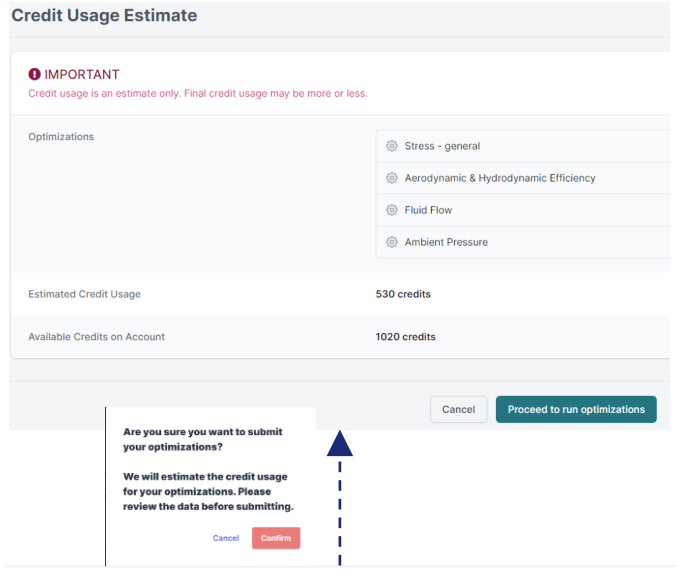
**(4) Choose workflow**

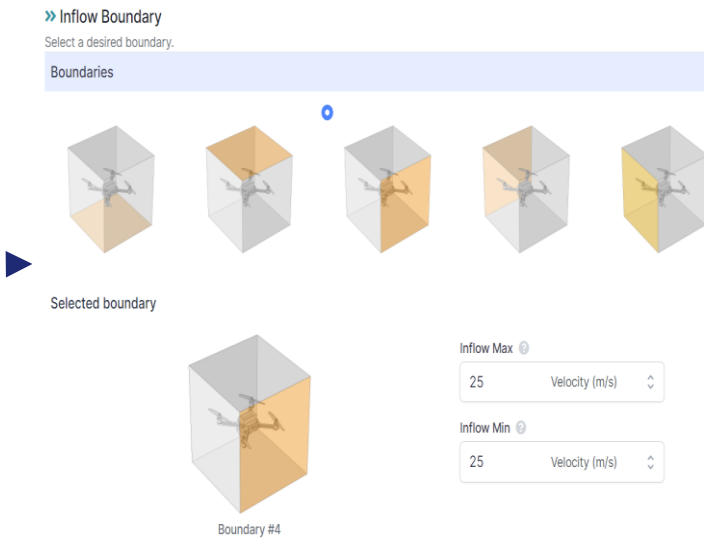
**(5) Define conditions, constraints and goals**

**(6) Submit & run!**
(credit estimate check)



# Powerful Results

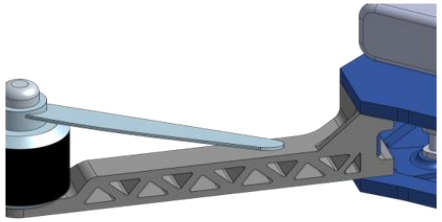
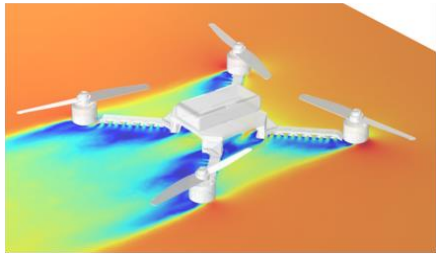
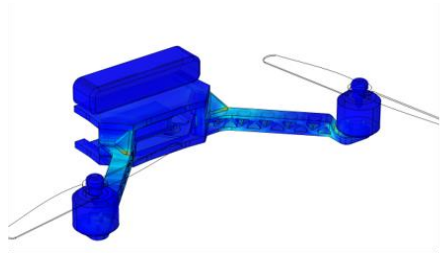
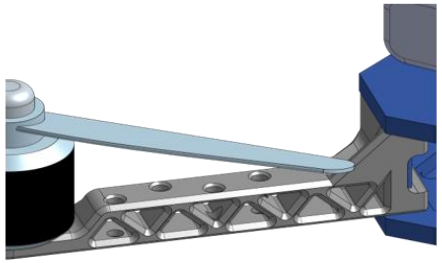
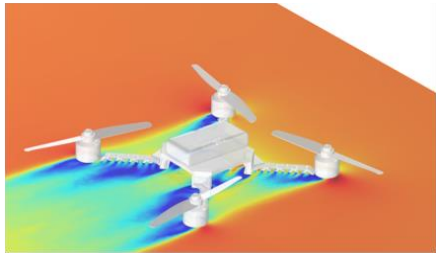
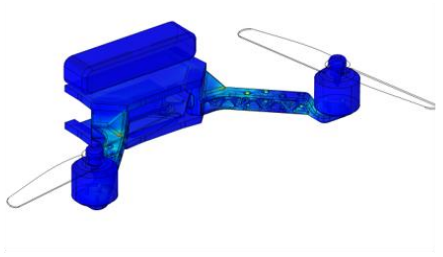
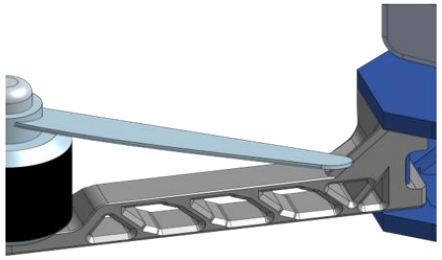
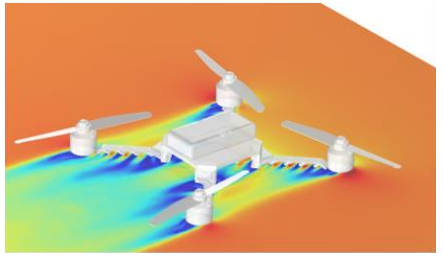
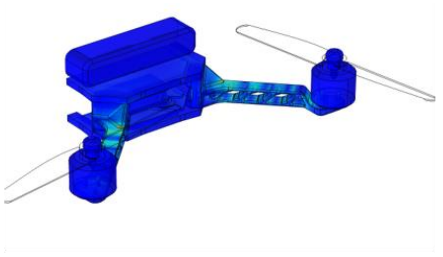
## (7) Check Updates

- Email or text notifications

## (8) Download:

- Analysis Dataset
- Optimized CAD assembly
- Summary of changes

## Design Evolution

| | CAD model | Aerodynamic Efficiency | Stress & Fatigue | Pressure |
|---|---|---|---|---|
| Rev 0 *(n=0)* |  |  |  | |
| Rev 1 *(n=18)* |  |  |  | |
| Rev 2 *(n=37)* |  |  |  | |