This PDF is a preview for diagram templates (2025)

Posting to openlab project, qr.net/openlabproject by David Malawey

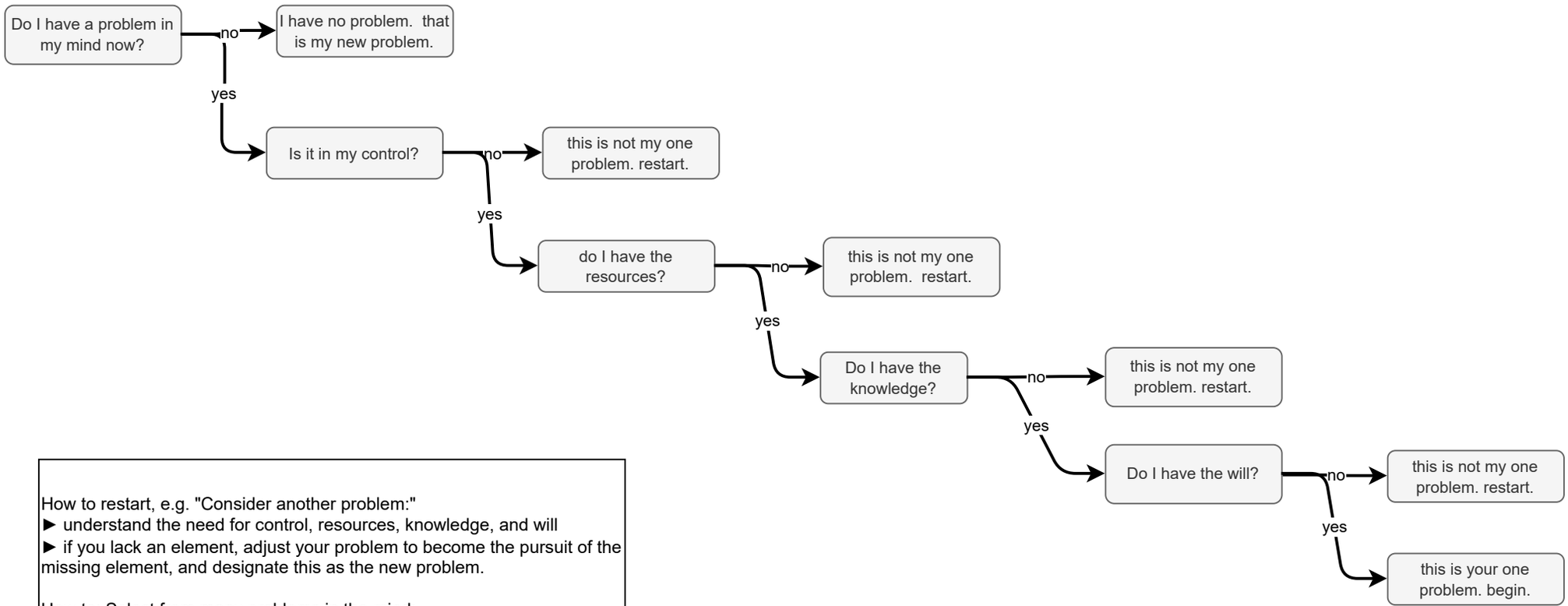
Purpose: download original vector diagrams to get a jumpstart on your diagram.

Value of the Templates:
The drawings included have a few years of experience behind them, for making readable documents, good for exporting to images or PDF, easily modified, etc. What's here that wasn't ready on day 1?

- colors and contrast are suitable for readability
- tree diagrams have vectors oriented properly to expand and adjust tree size
- background shapes help segment larger diagrams visually
- transparency is used to communicate key info vs details
- wiring diagrams have meaningful color selections for electronics
- electronics feature some customized connectors - a demonstration of how to connect wires to images.
- collapsible tree elements serve as potential interactive graphics for online publication.

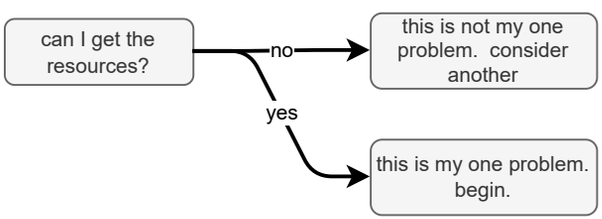
How to have only **one problem**.

(a fantastic excersise for people who have more than one problem)



How to restart, e.g. "Consider another problem:"
► understand the need for control, resources, knowledge, and will
► if you lack an element, adjust your problem to become the pursuit of the missing element, and designate this as the new problem.

How to: Select from many problems in the mind:
► Write down all your problems on paper. During this excercise, pause after the first one is written. Begin the exercise.



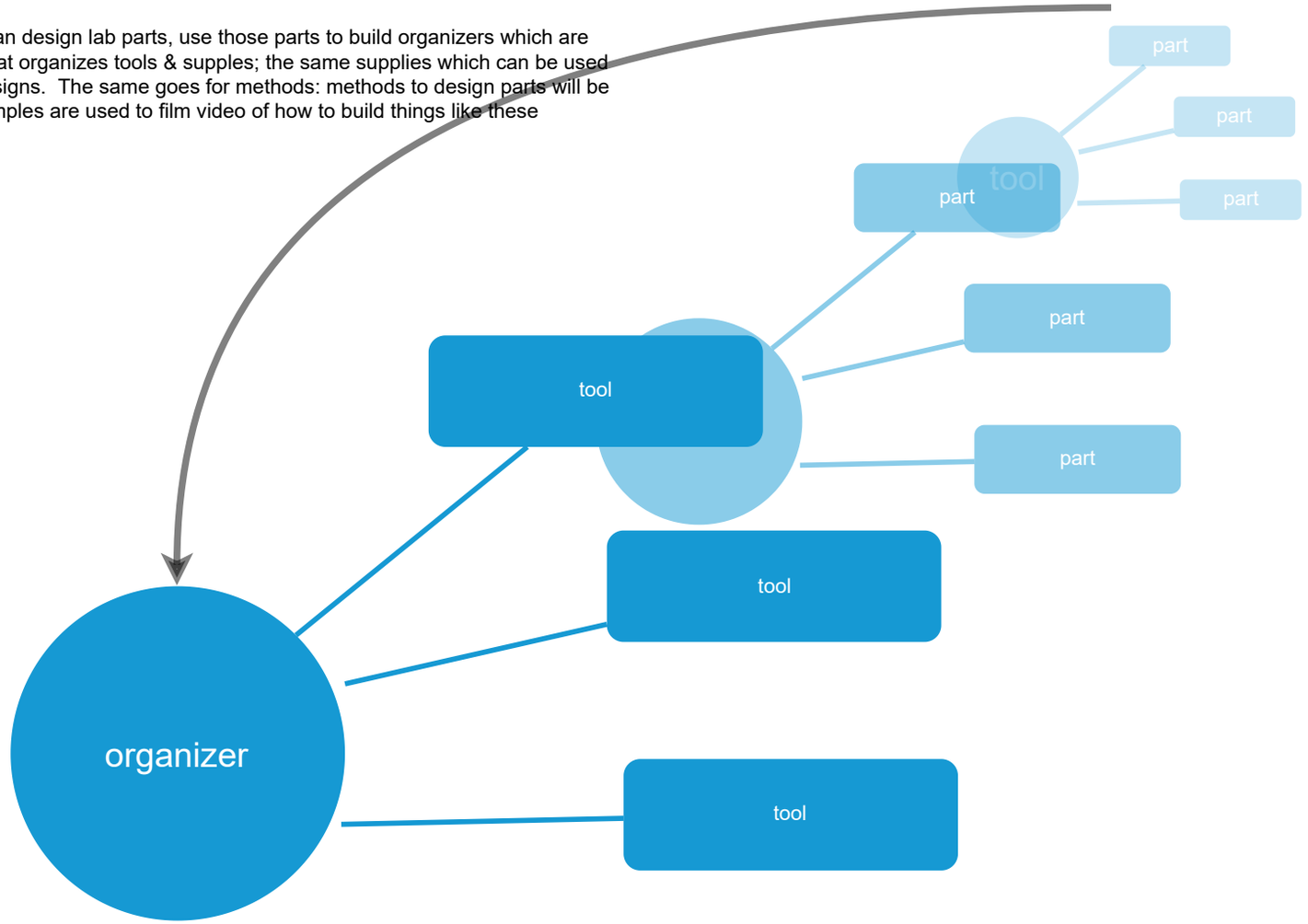
Lab Tools Diagram

(also a template for nested series expansion chart)

It is good to start with this template for colors & geometry: File►New►Templates► Living Beings Mind Map

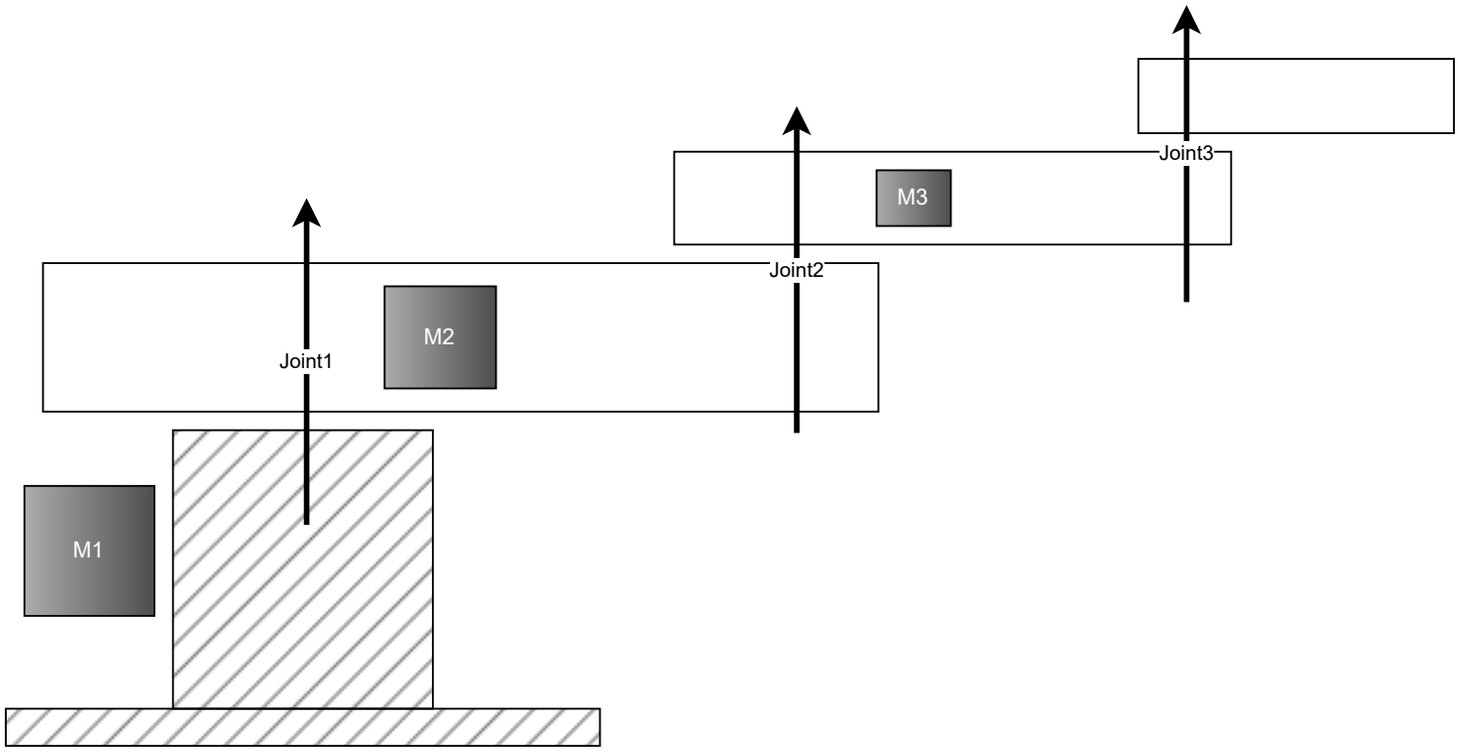
This diagram has 3 layers. Blocks are placed in a layer, made 50% transparent, and then a lower layer is created with 25% opacity and smaller blocks.

Purpose: This diagram is to show that we can design lab parts, use those parts to build organizers which are stored in the lab, and enhance the space that organizes tools & supples; the same supplies which can be used to build the lab itself or new engineering designs. The same goes for methods: methods to design parts will be used to design example parts, and the examples are used to film video of how to build things like these examples, using the methods used to build.



OpenArm

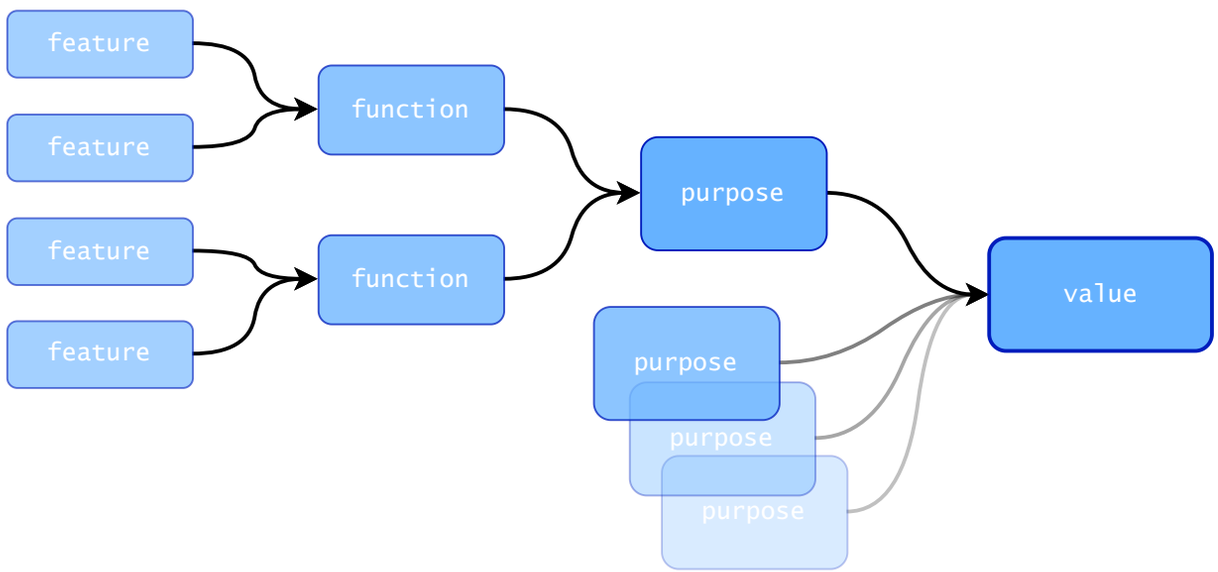
Template features: using shapes to draw mechanical arranement for a desired scale & configuration.



Feature ► Function ► Purpose ► Value

The terms herein are used in various ways but the definitions can be made more precise for this publication with the diagram at-hand.

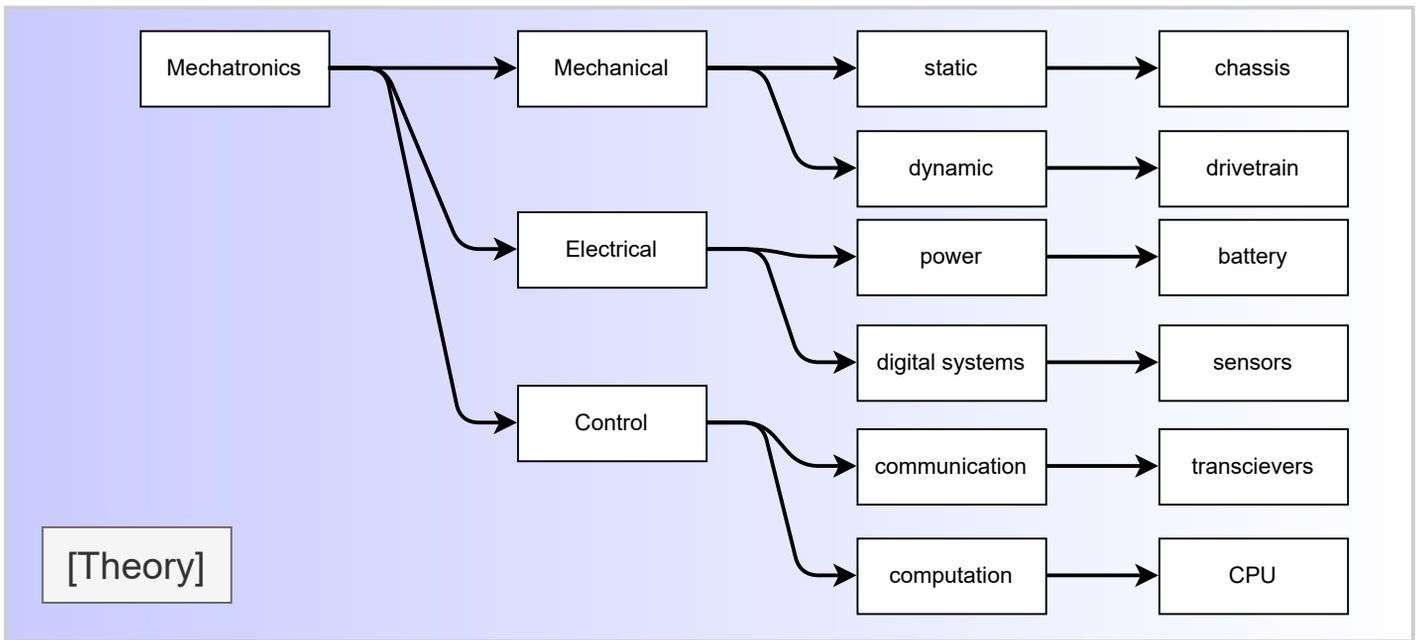
What makes this part highly valuable? It supports a large number of purpose-oriented designs.
What is the purpose of this design? It connects two beams and pivots with one degree of freedom.
What is the function of this geometry? It connects the part to the beam.
What is the feature that supports a good connection? It is a hole for receiving an M5 screw

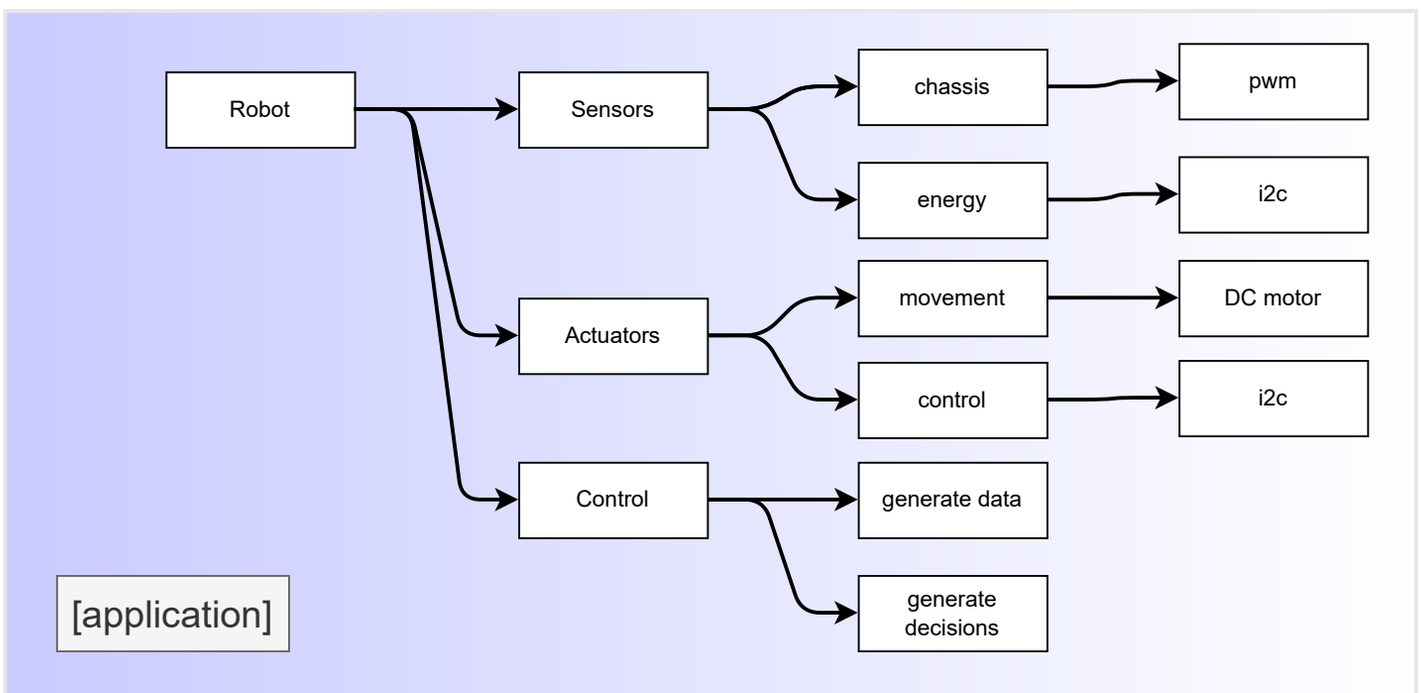


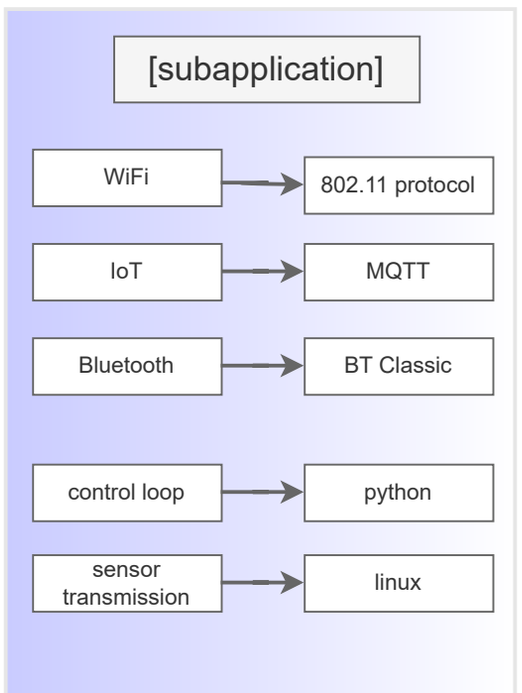
Foundations of Mechatronics (Foundations of Robotics)

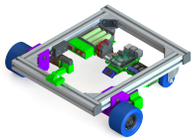
Drafted 2024.08
David Malawey

The same systems can be broken down in two ways: first as the field of mechatronics, and next as elements in an applied mechatronics system (a robot)







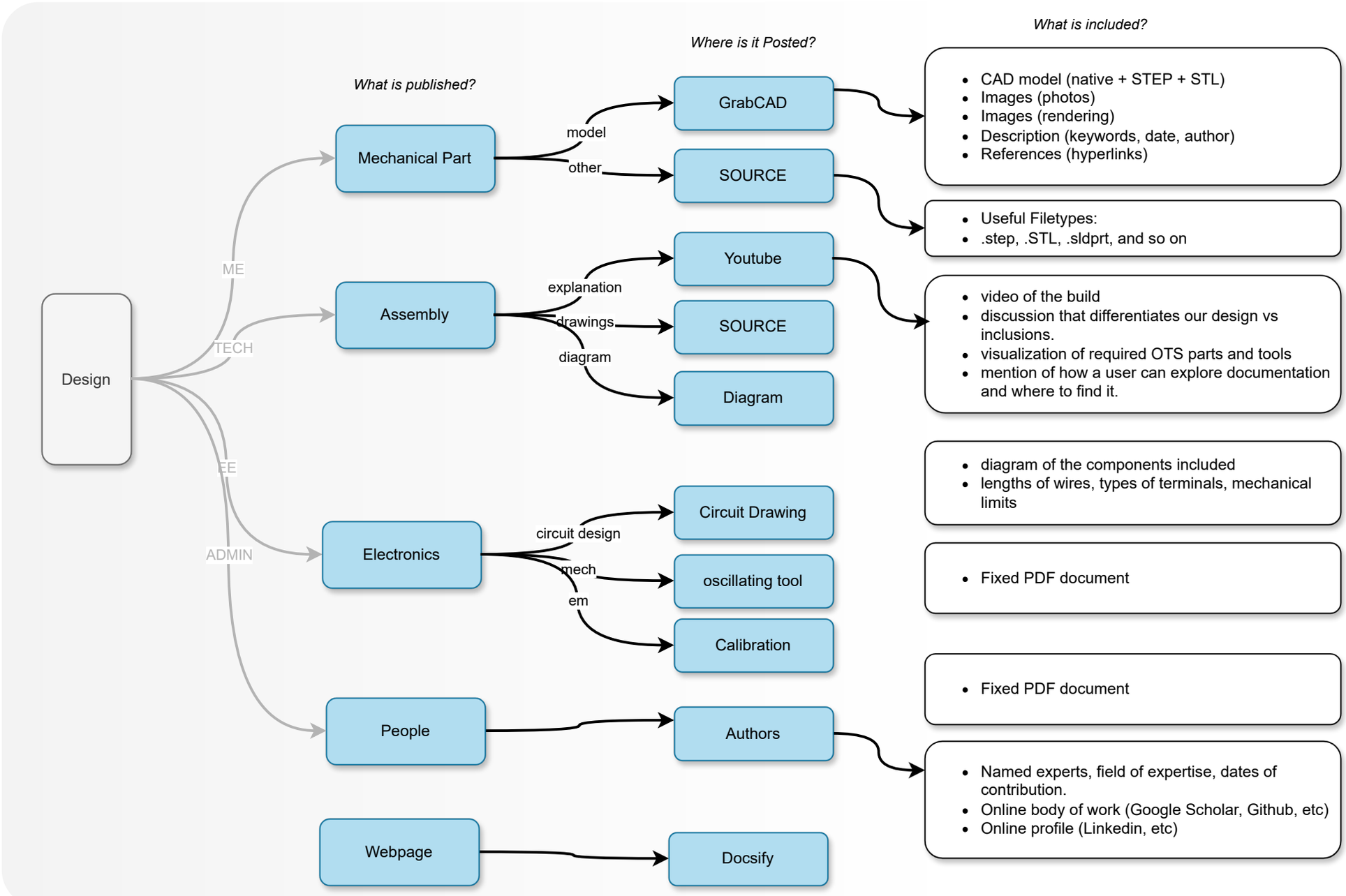


Open Source Meta-Design

A set of tools used to document multidisciplinary projects. This is the documentation of the documentation. By David Malawey, 2025.06

DRAFT

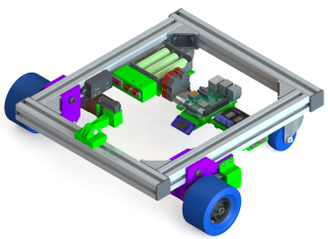
A true open sourced design must be published with the same level of integrity as an academic journal article. Here is our formulation to publish a design.



What is a Robust Design?

A sample of elements of robustness and their implications for the company, the customers, and ecosystem.

- Components are standardized
  - cost may pivot per use case
  - Design may change; standards are retained
- Modular
  - customization is easy
  - reconfigure to suit many use cases, easily
- Suppliers prolific, competitive
  - software errors don't cascade
  - Redundant supply chain
- Designs conforms to industry standards
  - frequent component upgrades
  - Tier-2 designers can support design
- contains industry-leading brands
  - suppliers market the product for free
- cybersecurity built-in
  - users have large selection, offerings have reputation
- expansive knowledge-base
  - can hire ready-trained talent (customers, designers, peers)
  - product supported if business fails
- software available broadly
  - 10,000 functions on day 1
  - firmware never outdated
- independent customers
  - product can advance in 10,000 ways, by 1,000 parties
  - customers can collaborate with each other



SCUTTLE

Toyota Corolla

SPOT

Ferrari

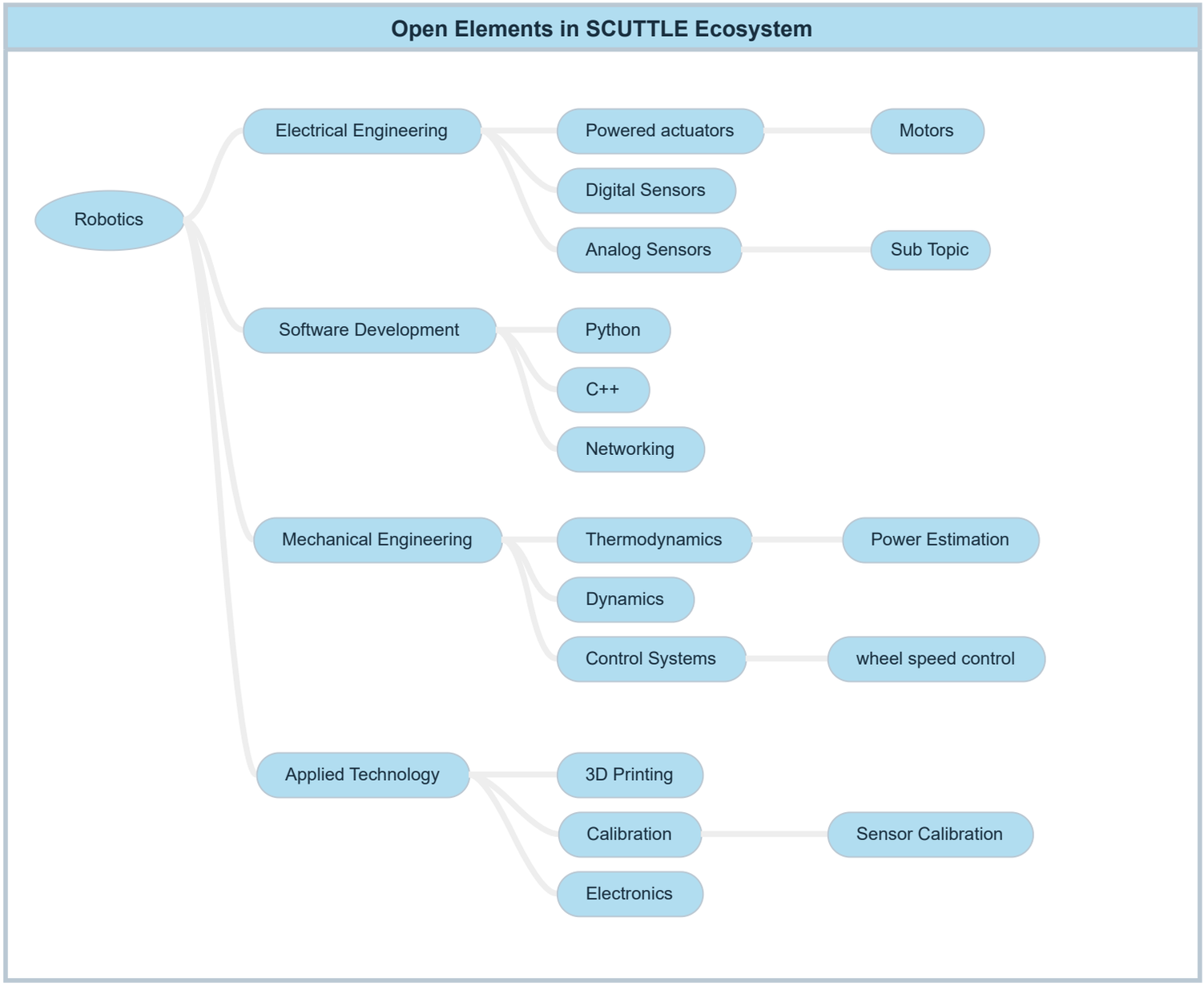
- components are custom
  - Cost is high, quality is high, exclusion of use cases
- Monolithic
  - not suitable until use case is examined & well-funded
  - software errors can wreck the product.
- Single-source suppliers
  - suppliers charge for custom effort, can price gouge
  - no upgrades offered
- Designs are nonstandard.
  - Tier-2 designers don't exist, or bill engineering hours
  - New standards, test procedures, & certifications required
- nonbranded components
  - suppliesrs do not market the product
- cybersecurity must be developed
  - users must rely on 1 company for support
  - users must trust designer for security
- knowledgebase starts from zero
  - no support if business fails
  - must train all developers from scratch
- software must be developed
  - support is expensive, limited options
  - Product is outdated if one key element is outdated
- DOD, Military customers
  - product relies on government funding
  - customers develop in secrecy; no p2p benefits

FACTS

IMPLICATIONS

Updated 2023 David Malawey

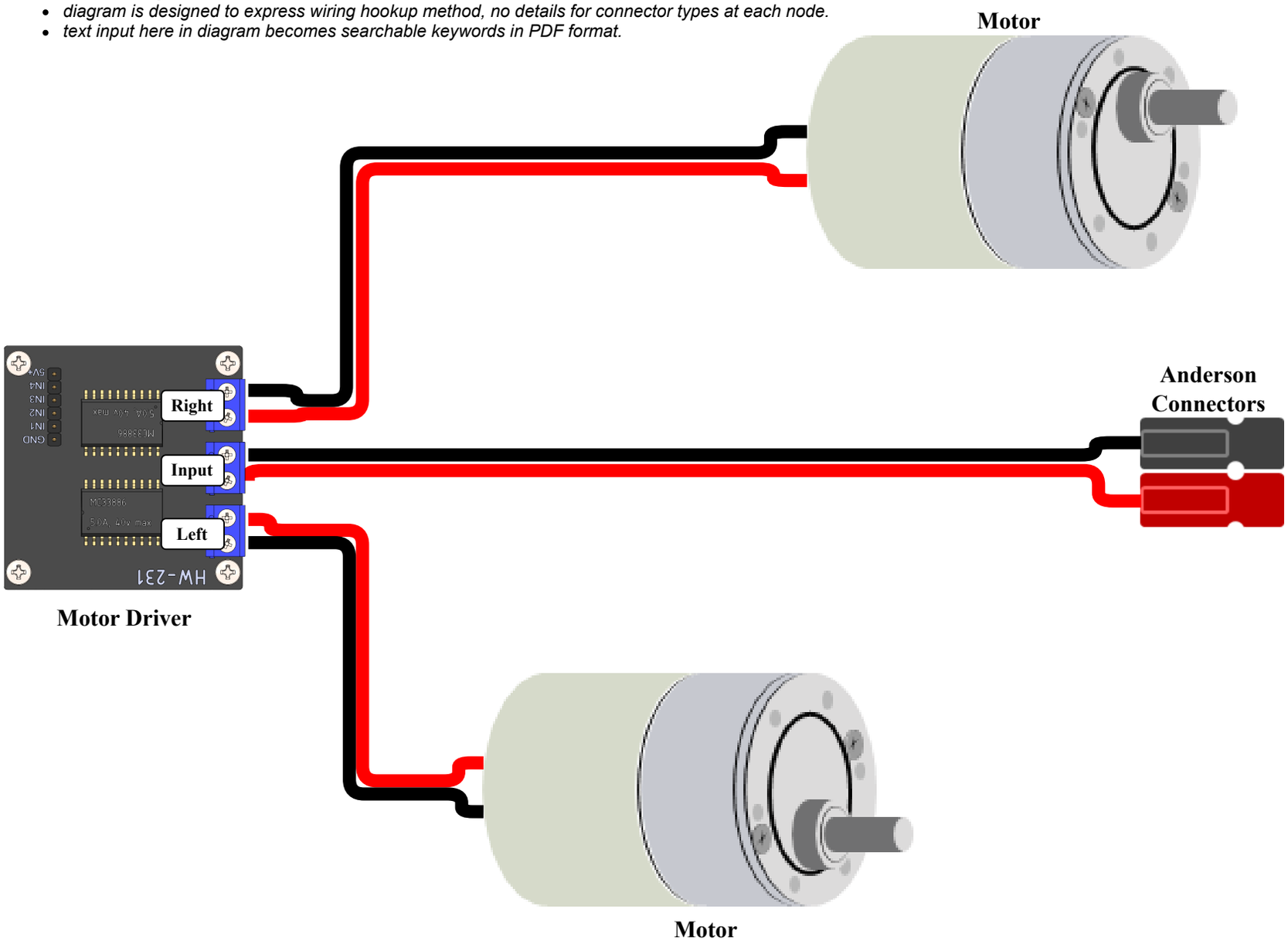
See Mindmap Tutorials



Power Diagram

Some template key points to copy:

- *power wires colored red & black to inform real colors*
- *font size large enough to read while zoomed out to full diagram*
- *boards feature connection-nodes (invisible) for accurate attachment of wires.*
- *scale: aiming for relative scale of motor, board, and wires.*
- *diagram is designed to express wiring hookup method, no details for connector types at each node.*
- *text input here in diagram becomes searchable keywords in PDF format.*



PIN Diagram

Some template key points to copy:

- *graphic is designed to show inputs and outputs of a board.*
- *good method to blow-up features*
- *image of board has enough detail to identify board and orientation - no more*
- *power inputs have red & black color scheme, data inputs have wire color scheme*
- *row of dupont pins can copy-paste for the next diagram; can adjust quantity of pins*
- *board is oriented for pins to stack vertically on diagram - easier text adjustment*