

taxon description language syntax overhaul

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definitions

movement - a block's position (coordinates of its centroid) changes

actuation - the block's children in the kinematic tree move, but the block itself does not

block - umbrella term referring to a motor, a tool, or a mechanism (formerly called "block", see change log below for more info)

changes:

- remove `buildEnvironment` property (maybe just for now)
- standardize `dimensions` in envelope such that `workEnvelope := (shape, dimensions, position)`
- rename the former top-level `blocks` property to `mechanisms`. objects that go in that are property are now known as "mechanisms". "blocks" now refers collectively to anything that's part of the machine that's rendered as a box: `motors, mechanisms, tools`.
- remove the `componentType` property everywhere. in the case of motors and tools, the value was always "motor" or "tool" respectively anyway, so we can infer this by just looking at the top-property anyway. in the case of mechanisms (formerly blocks), we resolve this issue as described below.
- for mechanisms (formerly blocks), replace `componentType` with `mechanismType` which can be either: `linear, parallel, cross, or nonActuating` (perhaps deltaBot some day soon). this emphasizes that the top-level abstraction of the mechanism is *only* about how many motors it is driven by, and how many axes it actuates on. by definition:
 - a linear mechanism has one driving motor and actuates on one axis

- a parallel mechanism has 2 or more driving motors and actuates on one axis
- a cross mechanism has 2 driving motors and actuates on two axes
- a non-actuating mechanism has 0 driving motors and actuates on 0 axes
- ideally, we check `mechanismType`, `drivingMotors`, and `actuationAxes` to enforce this definition.
- in mechanism objects, rename `"axes"` to be `"actuationAxes"`
- in motor objects, remove `"drivenStages"`—now the pairing of motors and mechanisms (formerly called blocks or stages) is indicated only within `"drivingMotors"` within a mechanism object.
- remove explicit `kinematics` as a mechanism-level property. all linear and all parallel mechanisms are assumed to have `directDrive` kinematics. all cross mechanisms have `hBot / coreXY` kinematics (the kinematic equations are the same, but the physical properties might be different. to address this, we move `hBot` vs. `coreXY` into the `attributes` property). we now only use terms like `"directDrive"` in the compiler and these terms are never exposed to the programmer.
- remove `"platform"` and `"toolAssembly"` as mechanism-level properties; instead, these now go in the mechanism's `attributes` property. again, this emphasizes that what we care about at the mechanism level is the input of motors and output of actuation.
- add new `metafeatures` property whose value is an object that contains any information about the machine that does not pertain to its volumetric or kinematic properties. as such, we move the formerly top-level `"vendorInfo"` and `"machineType"` properties in here. properties in the metafeature object are all optional, so we might as well add `"version"` as well.
- remove `connections` as a top-level property: now, blocks "own" their connections in which they are the parent (formerly called `baseBlock`) e.g.

```

"mechanisms": [
  {
    "name": "someParentMechanism",
    "connections": [
      {
        "child": "someChildMechanism"
        ...
      }
    ]
  }
]

```

```
]
```

- Condense connection syntax as shown, e.g. from:

```
{  
  "baseBlockName": "leadscrew motor a",  
  "baseBlockFace": "-y",  
  "baseBlockEnd": "0",  
  "addBlockName": "z leadscrews",  
  "addBlockFace": "+y",  
  "addBlockEnd": "+z"  
},
```

to:

```
{  
  // implicit: baseBlock is the block that owns this connection  
  "child": "y leadscrews",  
  "parentPoint": "-y.center",  
  "childPoint": "+y.+z"  
}
```

where "basePoint" and "addPoint" have the syntax "F.P" where F is in [+/-x, +/-y, +/-z]