A surprisingly awesome presentation title

with an awesome subtitle

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First part

Open challenges in Soft Robotics

Soft robotics is a new field of robotics purposefully designed with **soft elements** whose goal is to endow the system with **natural motion**[1].

This leads to a number of advantages:

- Flexibility,
- Hyper-redundancy,
- Passive w.r.t. its environment,
- (Extreme) durability;

[1] Or, depending on the background, biological morphology

Open challenges in Soft Robotics

... but also disadvantages

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- left column
  - item 1
  - item 2

- right column
  - item 1
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Implementation in Markdown

```
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  - item 1
  - item 2
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  - item 1
  - item 2
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LaTex converted using Pandoc

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\begin{columns}
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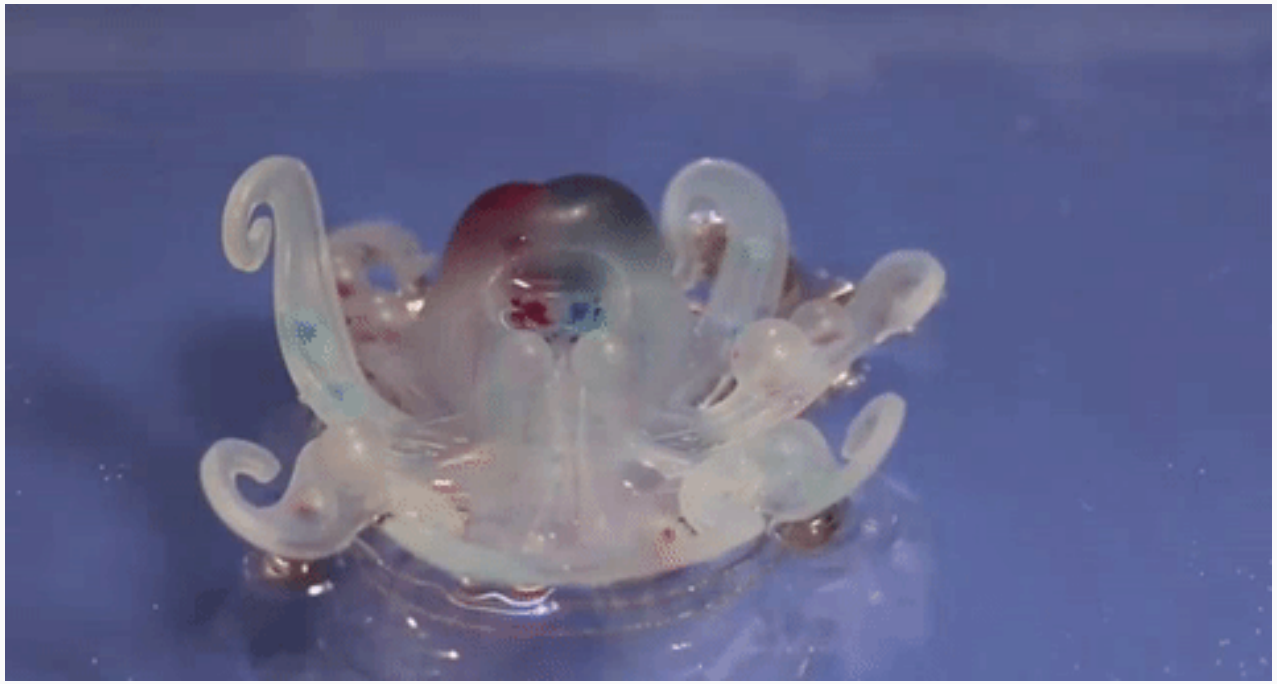
Some examples



Bouncing ball

Implementation in SOROTOKI

```
sdf = sCircle(1) - sCircle(0.75);     % sdf object
flr = sLine(-3,-3,-5,50);             % sdf floor

msh = Mesh(sdf,'NElem',500);          % generates mesh
fem = Fem(msh,'TimeStep',1/60);       % generates fem

fem.Material = Ecoflex0030();         % assign material

g = @(x) flr.eval(x);                 % constraint
fem.addConstraint('Contact',g);       % add contact

fem.simulate();                       % solve dynamics
```

Design synthesis of PneuNet

```
msh = Mesh(sdf,'NElem',3e3);

fem = Fem(msh,'TimeStep',1/60,...
              'VolumeInfill',0.25,...
              'Objective','Compliant',...
              'Repeat',ones(9,1),...
              'Material', Ecoflex0030);

[L, R]  = fem.FindNodes('Left','Right');
C  = fem.FindElements('Center',[],1);

fem = fem.addSupport(L,[1,1]);
fem = fem.addOutput(R,[0,-1]);
fem = fem.addMyocyte(C,10*kpa);

fem.optimize();
```

Design synthesis of PneuNet

```
msh = Mesh(sdf,'NElem',3e3);
  :
  :
fem.optimize();
```

```
mshr = fem.exportMesh(ISO,tol,[1,MinH,MaxH]);
  :
  :
femr.solve();
```

Closed-loop control

Consider the (Ph)-system:

$$\dot{x} = (\mathcal{J} - \mathcal{D})\nabla_x H(x) + G(x)u$$

where $H(x(q,p)) := \frac{1}{2}p^\top M^{-1}p + \mathcal{U}(q)$.