

# John Cassel

an introduction





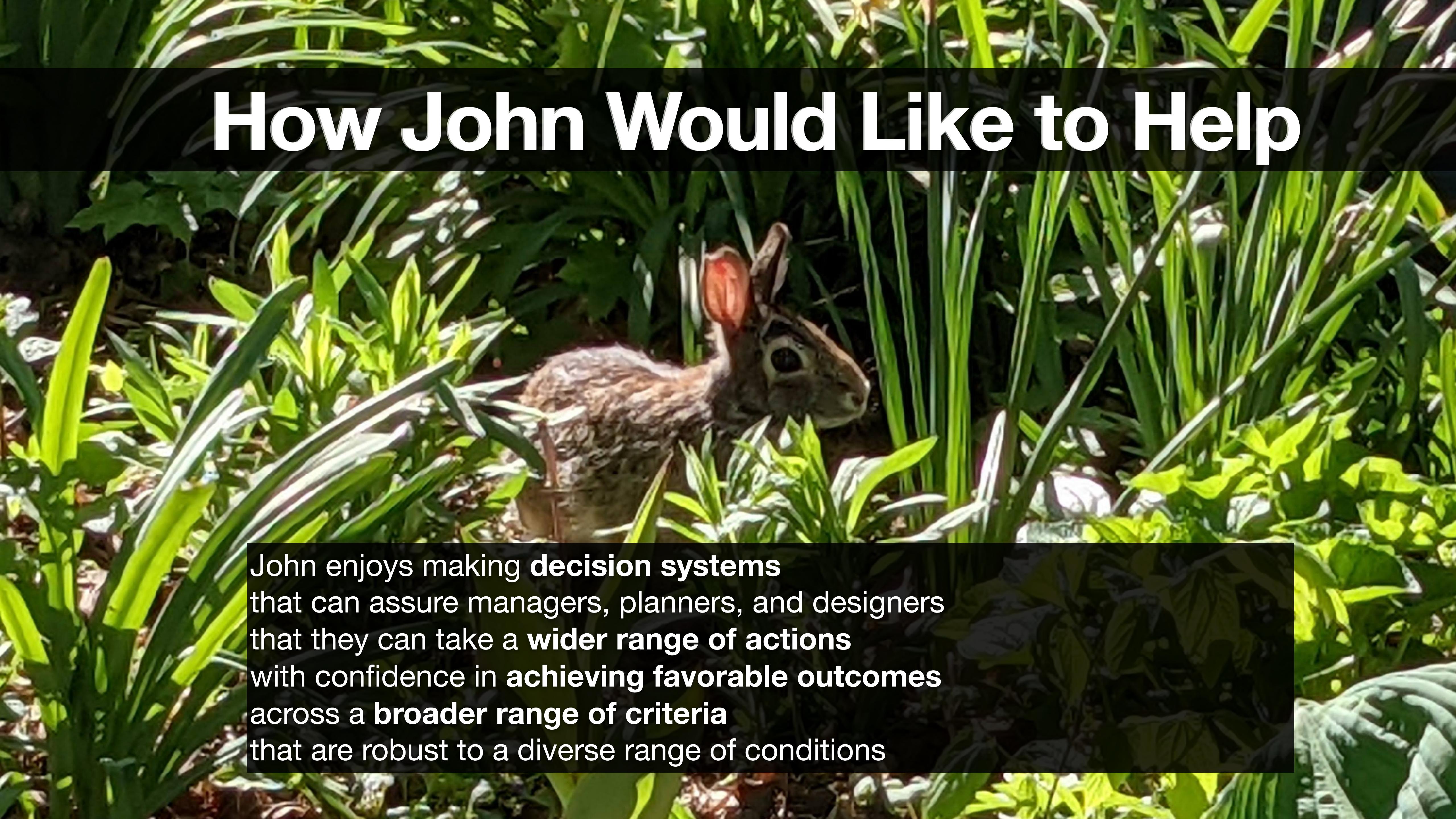
# Value Proposition



Discovery-driven domain design  
and software engineering  
of engineering design,  
operation management,  
or research support software  
for stewarding  
landscapes and infrastructure  
by multiple criteria

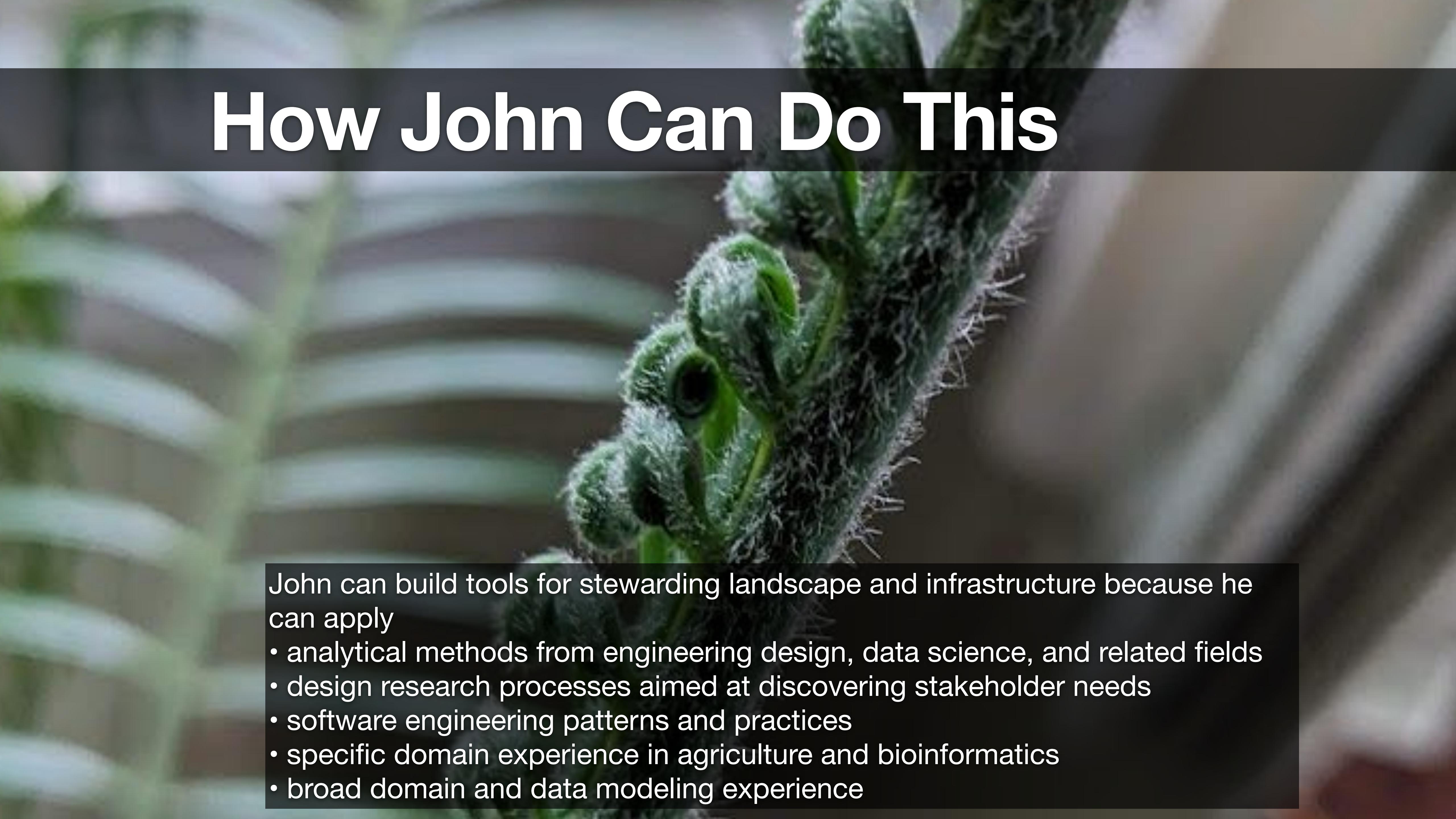
# Mission Statement

# How John Would Like to Help

A photograph of a small brown rabbit with white markings on its face and ears, sitting in a lush, green garden. The rabbit is positioned in the center-left of the frame, surrounded by various plants and leaves. It appears to be looking directly at the camera.

John enjoys making **decision systems**  
that can assure managers, planners, and designers  
that they can take a **wider range of actions**  
with confidence in **achieving favorable outcomes**  
across a **broader range of criteria**  
that are robust to a diverse range of conditions

# How John Can Do This



John can build tools for stewarding landscape and infrastructure because he can apply

- analytical methods from engineering design, data science, and related fields
- design research processes aimed at discovering stakeholder needs
- software engineering patterns and practices
- specific domain experience in agriculture and bioinformatics
- broad domain and data modeling experience

# Am I the audience for this?

If you could see how the previous slides applies to you and your team, then **yes**. Also, **yes** if you work on:

- **Tools for Sustainability Program Administration (particularly with a Smallholder/Worldwide focus)**
  - Relevant start-ups include Propagate, Boomitra, Perennial, Regrow Ag, HabiTerre, Agoro, Indigo, ...
  - Relevant large companies include ADM, Bayer, Cargill, Nutrien, Syngenta ,...
- **Agroecology Research or Related Computational Support**
  - Computational wings of research centers or non-profits (Center for Agroforestry, Savanna Institute, Land Institute)
  - Research support engineers, whether at agricultural engineering/crop science departments or at collaborating research support institutions (for example: National Center for Supercomputing Applications)
- **Specialty Crop Operation Planning**
  - Possibly useful to equipment manufacturers such as Bonsai Robotics, Carbon Robotics, Ripe Robotics, ... but certainly not excluding Mahindra, Flory Industries, Deere, AgCo, CNH, Trimble,...
  - Or other areas that stretch the applicability of new crops or cropping patterns
    - for example: landscape architecture software, biomanufacturing

A dense field of orange daylilies with green leaves.

Qualifications

“I highly recommend John for any future employer. I worked with John for several years at Indigo, and know John to be an outstanding colleague on both the personal and the professional front. ...”

“I have had the privilege of observing John's positive attitude, openness and general technical leadership first hand. ...”

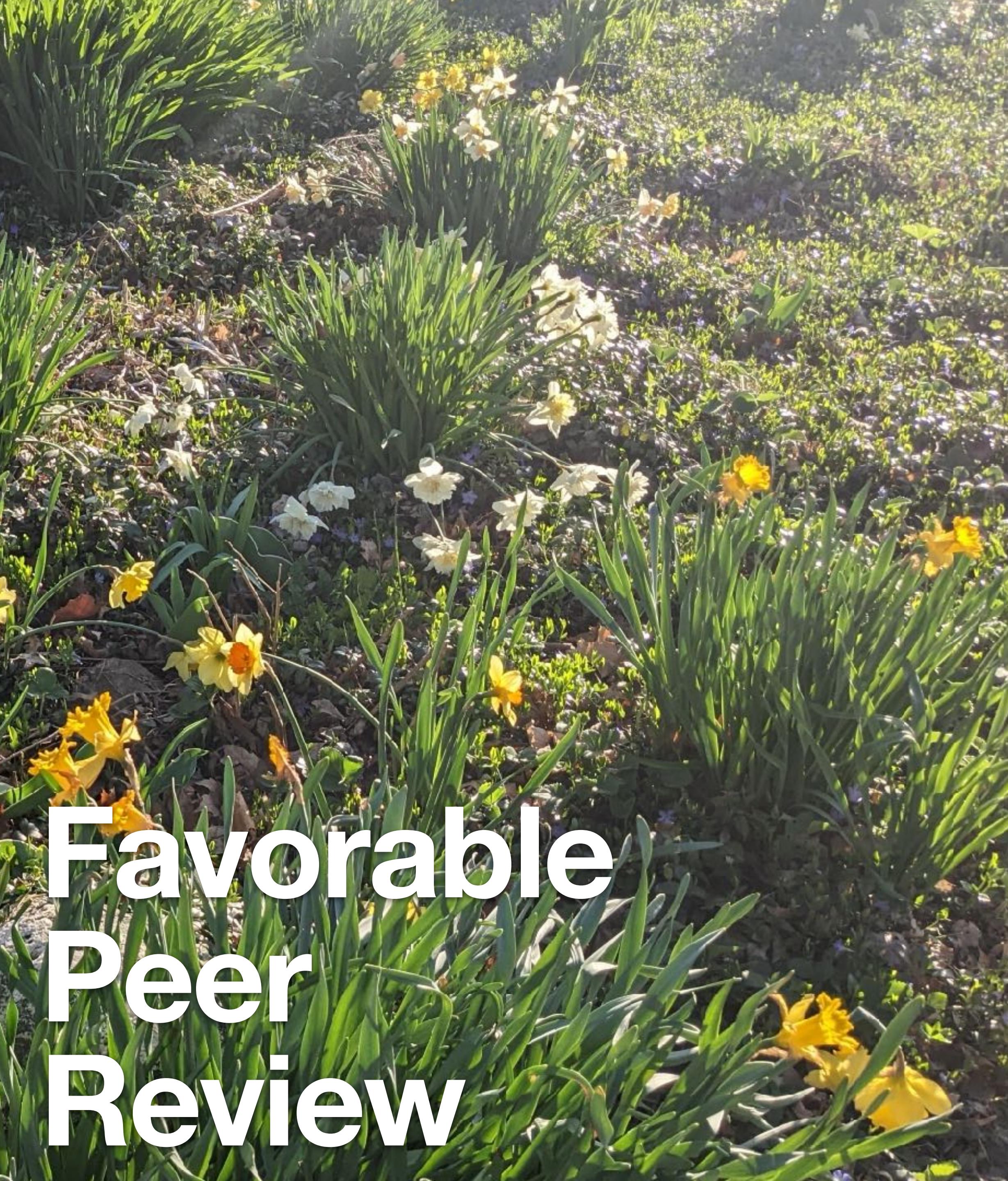
“... John's friendly demeanor and dedication to fostering a positive culture truly set him apart. I highly recommend him for his technical prowess, systemic thinking, and ability to inspire those around him.”

“Working with John has been a highlight for me. In addition to having a breadth of technical knowledge and being an excellent problem-solver and systems architect, John consistently brings a positive attitude to challenging situations and helps to bring out the best in his colleagues. ...”

“... John's unique blend of technical expertise, strategic foresight, and commitment to environmental stewardship makes him a standout professional. ...”

“... In conclusion, I don't think there's any hesitation in recommending John Cassel for future projects or collaborations. He has consistently demonstrated professionalism, dedication, and expertise, making him a highly respected and valuable team member. His positive impact on both the technical and interpersonal aspects of our projects makes him an outstanding professional.”

See recommendations at <https://www.linkedin.com/in/john-cassel-6480502/> for more



Favorable  
Peer  
Review

# Notable Achievements

- **As a Principal Software Engineer at Indigo Agriculture:**
  - guided multiple teams, multiple sources of data, and multiple sustainability programs towards adoption of an integrated schema
- **As a Research Programmer at Wolfram|Alpha:**
  - drove a cross-team effort for biological content expansion that helped win a major client
  - led introducing the biomolecular sequence vertical for the Wolfram Language
- **As a Systems Engineer at Agrible:**
  - co-created the main task processing system of the analysis backend
  - led the development of the primary representation and interface for farm activities
- **As a Software Engineer at Wolfram|Alpha:**
  - co-created the database backend, including database runtime, database deployment, curation tooling, production patching, and object/geospatial features



# Highlight Moments

- Major Research Project at OCAD U (for Master of Design in Strategic Foresight and Innovation)
  - Major Project: *Addressing Risk Governance Deficits through Scenario Modeling Practices.*
  - Committee review excerpt: “*John’s work as demonstrated in the MRP can be recognized as an important contribution to systemic foresight theory and practice.... It has a serious moral thrust in its ability to deal effectively with problems of significant scale and complexity. Because of this temper, this methodology can ... facilitate breakthroughs of understanding, consensus for action, and the coordination of social power*”
- At Wolfram, created an **Engineering Design Toolkit** (not released) by putting in a few hours every day before going to work
- **Thanksgiving 2023 Talk:** gave a motivational talk to the Indigo technology division about going forward positively after a second round of layoffs that year



## Instances of Tenacity

- Spontaneously monitored servers at 4:30 am for months to see morning reports got sent
- Cleaned and published genetic sequences every day for months during COVID-19
- Handled data release as a member of a team the delivered a tested software product consistently every week for over a year
- Called for a restoration from a backup in the middle of an investor demo to preserve customer data

**Knowledge:** sustainable ag, software engineering, engineering design, ML, planning, data & system modeling, GIS, basic ecology, strategic foresight, ...



	<b>UIUC Comp Sci</b>	<b>NCSA</b>	<b>Riverglass</b>	<b>Wolfram (Data)</b>	<b>OCAD U SF &amp; I</b>	<b>Agrible</b>	<b>Wolfram (Biology)</b>	<b>Indigo</b>
<b>Programming</b>	X	X	X	X	X	X	X	X
<b>Databases/Data Models</b>	X	X	X	X	X	X	X	X
<b>Discovery/Design Processes</b>					X		X	X
<b>Backend Service Development</b>				X		X		X
<b>Distributed/Cloud Compute</b>	X	X				X		X
<b>Machine Learning/Data Sci</b>	X	X	X	X				X
<b>Engineering Design</b>	X			X	X			X
<b>Sustainable Agriculture</b>						X		X
<b>Biology/Ecology</b>						X	X	X
<b>Strategic Foresight</b>				X	X			X
<b>Geographic Info Systems (GIS)</b>	X			X		X		X
<b>Management (Interns)</b>						X	X	

# Knowledge through Experience



# Point of View

Do Not Disturb Gravel

# Vision

## *Variety at Scale*

deploying computation-supported flexibility  
to select and deploy varying crops and field operations at scale  
for improved multi-criteria agro-ecological performance

# Approach

**How we get there matters:**  
we work towards the world we want  
by building caring environments  
and situations

A photograph of a dense forest. The foreground is filled with the trunks of tall, mature trees, their bark varying in color from dark brown to light grey. Sunlight filters through the canopy of leaves above, creating bright patches on the forest floor and long shadows. The ground is covered with a mix of green grass, fallen leaves, and fallen branches. In the distance, more trees and foliage are visible, creating a sense of depth.

Opportunities Sought



# Professional Roles Sought

- **(Senior/Staff/Principal) Software Engineer** with focuses such as:
  - Design and Planning Tools
  - Domain Design and Backend Service Architecture
  - Design of Research Environments for Science/Data Science
  - Sense-making and Ambiguous Situation Framing
  - Appropriate and Sustainable Introduction of Decision Automation
- Roles in **Data Science, Data Engineering, Product Management, Program Management, Systemic Design, Strategic Foresight Research, or Engineering Management** would also be entirely appropriate

# Academic Roles Sought

- **Graduate Researcher** investigating related topics, including but not limited to:
  - applications of open-ended multi-disciplinary optimization to multifunctional agricultural and landscape system design
  - sustainability trade-offs for appropriate use of decision technology in agro-ecological decision making
  - current and theoretical limits for the feasibility of handling crop variety at scale

# Compensation



Fair salary and benefits for a  
modest-living, mid-career, USA Midwest software engineer  
(or level-appropriate academic funding)

# Location

Ideally,  
remote or  
hybrid from  
Champaign,  
Illinois



A close-up photograph of a monarch butterfly resting on a cluster of vibrant purple flowers with yellow centers. The butterfly's wings are patterned with orange, black, and white. The background consists of dense green foliage and more flowers.

# Start Anywhere

There are many ways to  
discover the right opportunity,  
so let's figure it out together.



# Conclusion



# Stance

There are many temptations to use computation for purposes other than our collective flourishing. It will take not only expertise and knowledge, but discretion, judgment, and character to demonstrate the leadership that pursues better means and ends.

I may not be successful at this, but I will certainly try.



# Thank You!

I appreciate the time and consideration you've given these materials!

If you know of someone who might find this intriguing, don't hesitate to forward this on.

I am best found at [https://  
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