Robb Beal
Fall/Winter 2024-25

Computational Products & Experiences

Robb's a veteran, insatiably curious digital innovation pro with **computational design superpowers** from deep research investment over the past 5+ years.

> *The design spaces of the products and services of the near future are too large/complex to explore manually and the move towards adaptive/personalized experiences is inexorable.*

In Fall/Winter 2024, I'm looking to collaborate with/work for product, design, and data science leaders/founders who recognize this and need help taking the steps **towards computational products/design maturity.**

Capabilities/Themes

- Product Design with Diffusion Models in Visual Computing
- User Sequence Analytics
- Causal Product Discovery
- Human-in-the-Loop Design Evaluation
- Adaptive/Personalized Experiences
- User Simulation
- Socio-Conversational Systems

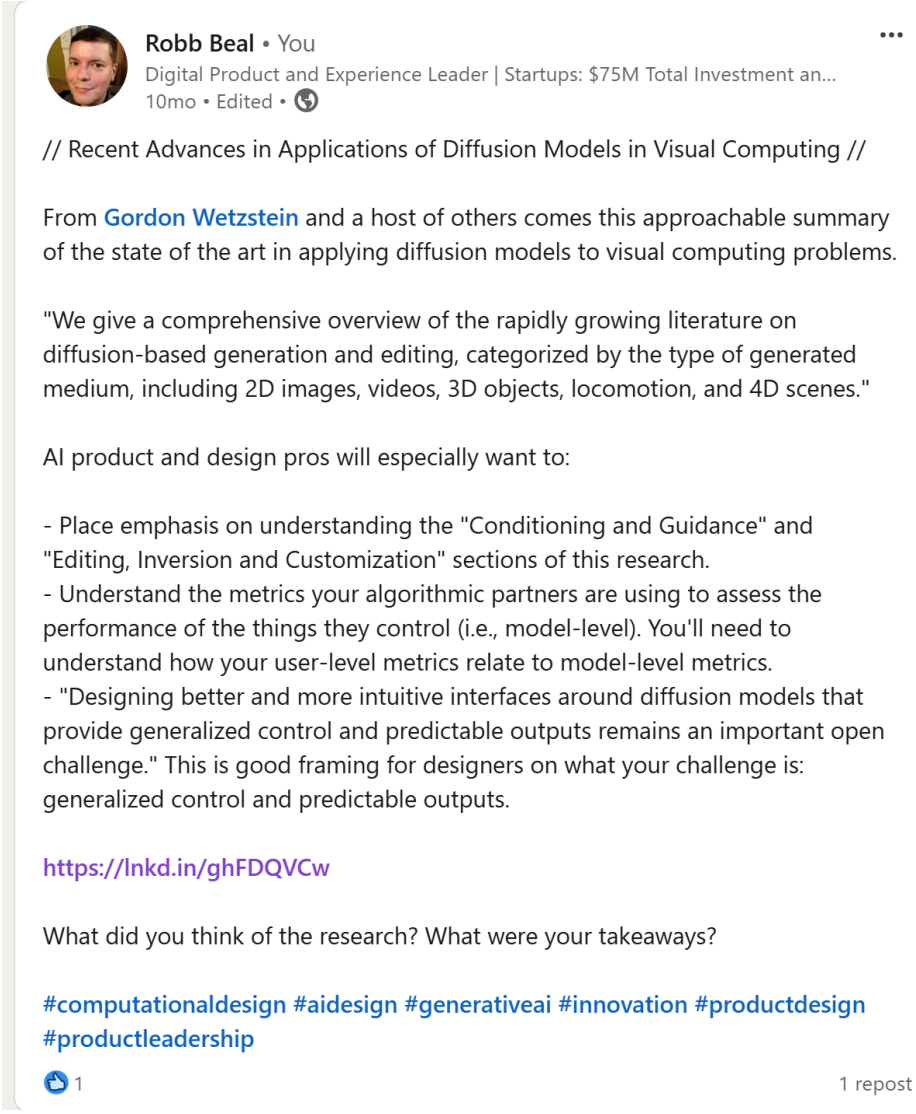
Explored in more depth in the following pages.

Product Design with Diffusion Models in Visual Computing

I'm interested in engaging with startups and internal innovation groups on designing efficient, intuitive interfaces around diffusion models that provide generalized control and predictable outputs (e.g. in editing, personalization) across 2D images, videos, 3D objects, locomotion, and 4D scenes.

As an example, see this Real-World AI UI Design Challenge I created for applying Adobe's Diffusion Image Analogies research.

I'd walk through a brick wall to work with Fairly Trained companies here.



Robb Beal • You
Digital Product and Experience Leader | Startups: $75M Total Investment an...
10mo • Edited •

// Recent Advances in Applications of Diffusion Models in Visual Computing //

From **Gordon Wetzstein** and a host of others comes this approachable summary of the state of the art in applying diffusion models to visual computing problems.

"We give a comprehensive overview of the rapidly growing literature on diffusion-based generation and editing, categorized by the type of generated medium, including 2D images, videos, 3D objects, locomotion, and 4D scenes."

AI product and design pros will especially want to:

- Place emphasis on understanding the "Conditioning and Guidance" and "Editing, Inversion and Customization" sections of this research.
- Understand the metrics your algorithmic partners are using to assess the performance of the things they control (i.e., model-level). You'll need to understand how your user-level metrics relate to model-level metrics.
- "Designing better and more intuitive interfaces around diffusion models that provide generalized control and predictable outputs remains an important open challenge." This is good framing for designers on what your challenge is: generalized control and predictable outputs.

https://lnkd.in/ghFDQVCw

What did you think of the research? What were your takeaways?

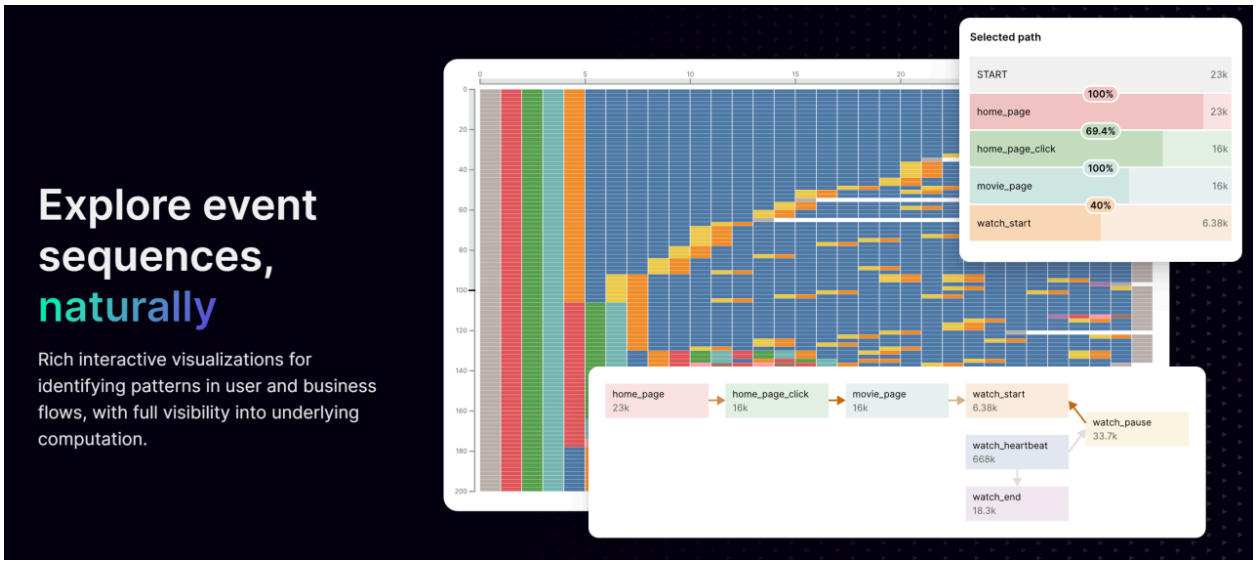
#computationaldesign #aidesign #generativeai #innovation #productdesign #productleadership

1 1 repost

Causal Discovery for Product Analytics

Startup Motif Analytics captured my imagination with its pioneering general user sequence analytics product and more recently, [automating the process for generating hypotheses] that is as reliable as experimentation is for testing hypotheses.

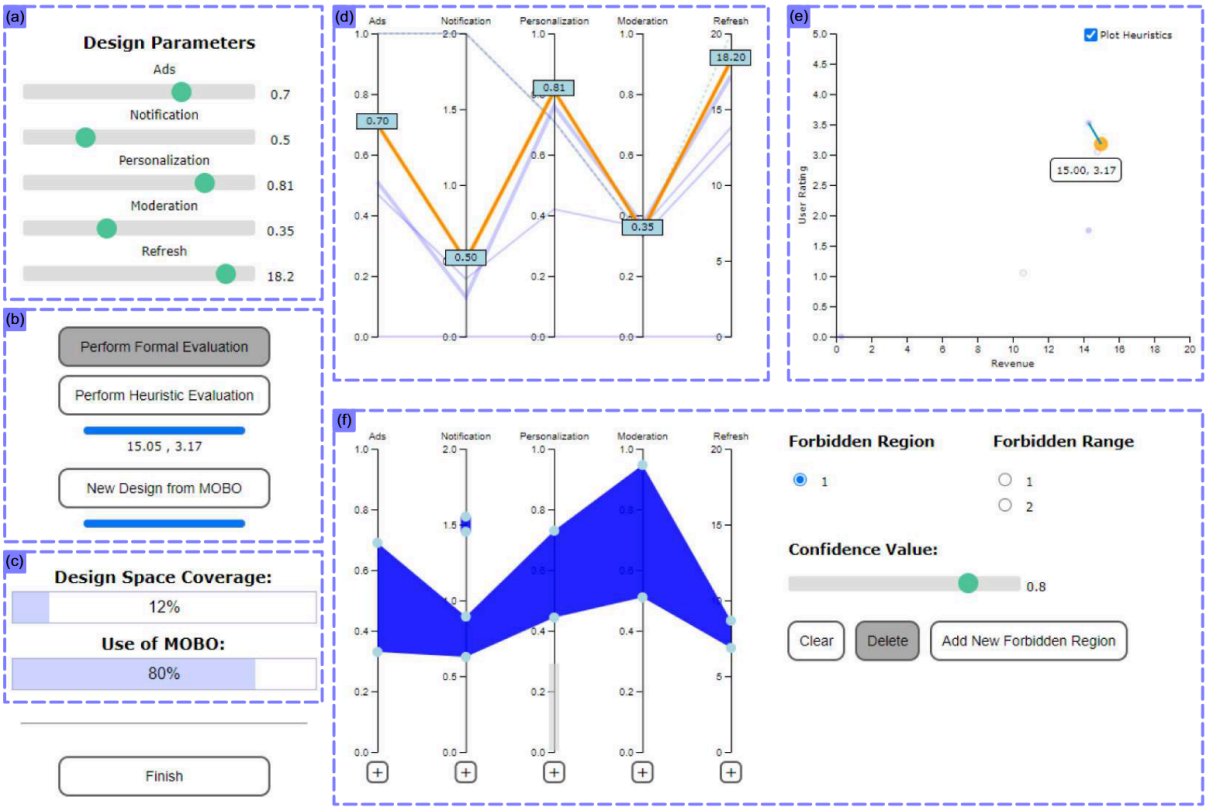
I'd love to help companies evaluate whether, when and how to invest in Motif and other similar tools.



Human-in-the-loop Optimization (HILO) for Design

HILO offers design teams a computational alternative to manual, laborious exploration of large design spaces: rather than relying on designers to choose the next design for evaluation, the process uses computational optimizers to intelligently select design instances while human subjects evaluate the design instances by interacting with them.

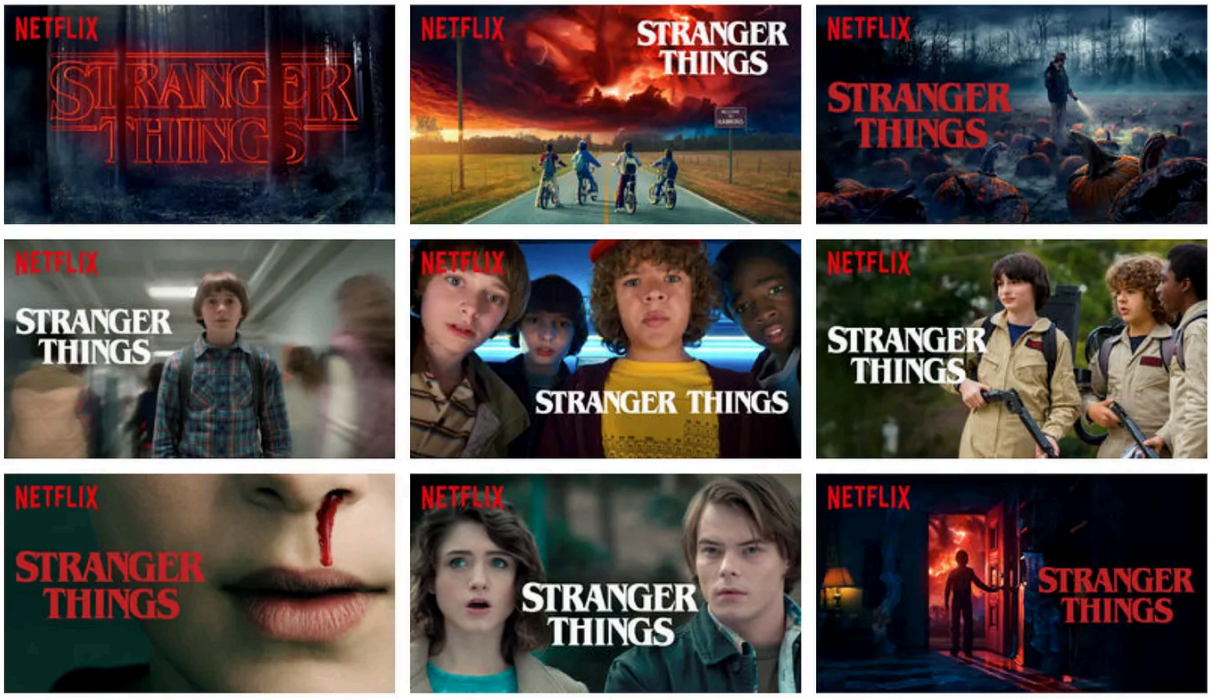
I'm especially interested in building off of the design tool prototypes built by Cambridge University researchers as described in Cooperative Multi-Objective Bayesian Design Optimization (UI excerpt below).



Adaptive/Personalized Design

I'm interested in collaborating with teams that see/sense the huge potential of adaptive/personalized UX design (through computational means like contextual bandits).

A great case study and explainer comes from Netflix where it used contextual bandits for [Artwork Personalization at Netflix] (excerpt from that research below).



Artwork for Stranger Things that each receive over 5% of impressions from our personalization algorithm. Different images cover a breadth of themes in the show to go beyond what any single image portrays.

User Simulation: Encoding Key Principles of Behavior without the Need for Large Labeled Datasets

Based on research by Antti Oulasvirta, who taught the computational design summer school that ignited my interest, I'm finding inspiration in "gray box" approaches that combine theory-informed perceptual models and machine learning models, especially for interactive AI.

This user simulation approach is being used/explored by design teams at Google for touchscreen typing simulation with the following applications:

- Facilitates the development of more efficient keyboard layouts to enhance typing speed
- Assists in evaluating the accessibility of touchscreen keyboards for individuals with disabilities (e.g., those with limited finger accuracy or exhibiting memory impairments)
- Simulates typing patterns to develop/refine biometric security measures that exploit keystroke dynamics
- Simulates player behavior in games that involve text input, thereby enhancing game design and testing.

Great AI Product Experiences Inspo

Descript (Underlord). For great human-centered AI design for its video editing app as described below.

Robb Beal • You
Digital Product and Experience Leader | Startups: $75M Total Investment a...
1mo

Y'all nailed the appropriate tone to bring predictive functionality/experiences like underlord to users in a way that acknowledges their expertise/creativity.

On the product front, appreciating your attention to the ease of undo'ing underlord-initiated actions and the naming groups of intelligent actions to suggest they're centered on you (looking good, sounding good, etc).

Like · 1 | Reply · 1 Reply

Laura B. Author
VP of Product @ Descript
1mo

Thanks so much for this feedback, Robb! Keep it coming! And yes, we've thought a lot about the AI for creators. What is the role that this technology plays in our workflow? Right now it's pretty obvious that if you hand over the reins entirely, especially in the ideation and production phases, you end up with a bu ...see more

Like | Reply

Great AI Product Experience Inspo

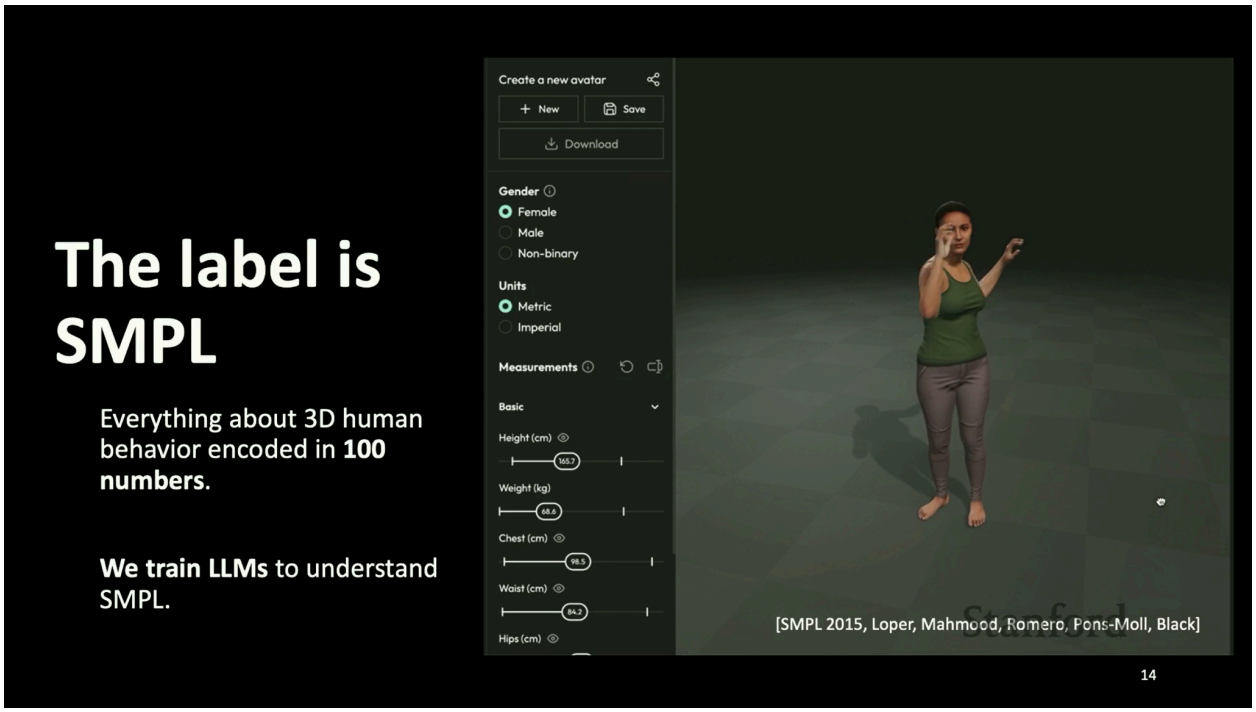
Hume. For its voice AI that responds empathically and being a great example of socio-conversational system design.

> *Socio-conversational systems are dialogue systems, including what are sometimes referred to as chatbots, vocal assistants, social robots, and embodied conversational agents, that are capable of* ***interacting with humans in a way that treats both the specifically social nature of the interaction and the content of a task.***

Hume's interactive voice AI podcast chatting about computational design

Great AI Product Experiences Inspo

Meshcapade. A startup offering lightweight animated 3D avatar creation from a range of data sources, including video (markerless mocap), photos and real-world measurements based on science from vision, graphics, and learning.



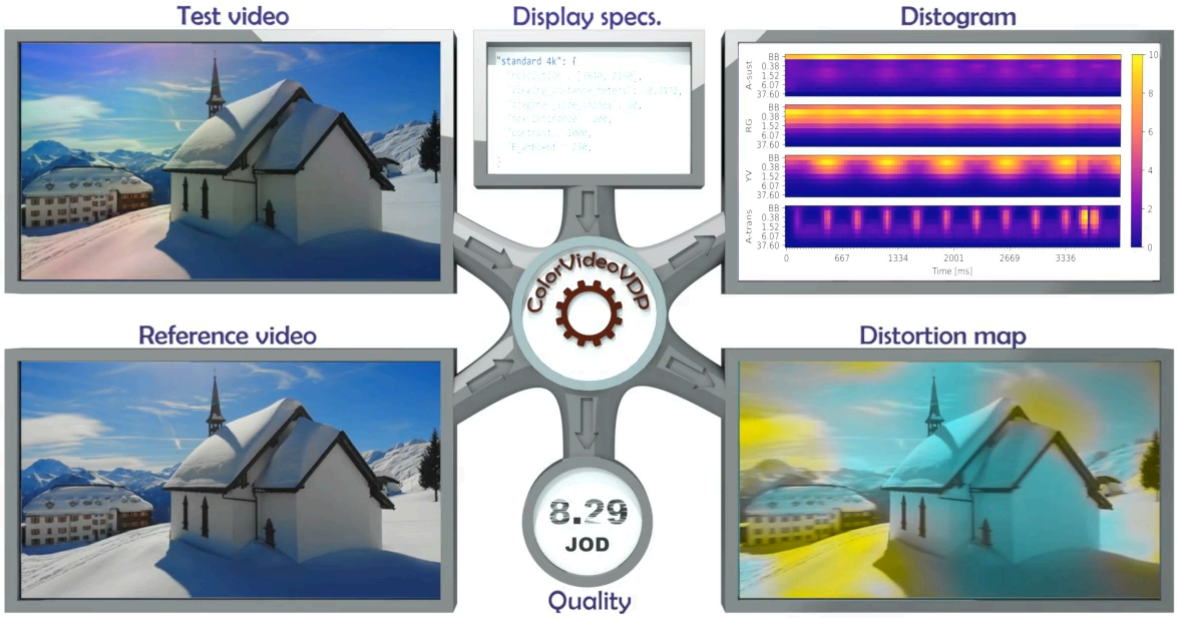
One More Thing

Applied Research at the Intersection of Computer Graphics/Gaming and Displays

Through [Display-Adaptive]

The display is the hardware component in personal computing systems that offers the greatest leverage to improve user experiences. Thus, Robb and collaborators have invested heavily in understanding how and which display innovations could be appropriately leveraged by design teams.

- Perceptual Video Quality/Difference Metrics
- High Dynamic Range Imaging
- Wide Color Gamut (especially interactive color space visualization)
- Immersive Displays



Explanatory graphic for ColorVideoVDP, a state-of-the-art perceptual video/image difference metric.

People I Especially Want to Collaborate/Work With

A small sampling...

- Joshua Noble on causality for design
- Amelia Wattenberger on any of her current prototyping themes: make email easy, help me think, or make me a better writer
- Visual design tools companies like Escape Motions and others who are meeting artists where they are through deep collaboration
- Bret Victor and others on additional science verticals for communal computing
- Folks like Steve Ruiz, Paul Rony, and teams on incorporating aspects of my pioneering infinite canvas app work into tldraw, Kosmik, etc.
- Folks working on telepresence/immersive displays and immersive input innovators like the team at Logitech working on MX Ink stylus
- Alexey Ardov and David Aerne on interactive color visualizations (e.g. Google Maps for Color and Light)
- Folks at Netflix working on computational innovations in live streaming/gaming experiences. (Recs for potential Netflix collaborators appreciated.)
- Keenan Crane on applications of geometry processing
- Pavel Samsonov, Josh Lovejoy, and others on adaptive/personalized experiences
- Human-Robot Interaction designers at Skydio, DJI (Cinema), Cobot, and elsewhere
- Ethnographers and other social scientists putting the socio into sociotechnical systems (e.g. Mona Sloane and team revealing how assumptions built into technologies shift, stabilize, and become infrastructural in the design and use of technologies)
- Product, Design, and Data Science pros in my US geo like Amanda Andres, Dan Vatterott, Tom Greever , Scott Kennedy, and Erik Dahl

Startups Summary

Laszlo Systems
B2B2C Messaging, Pioneering UI Animation ✦ General Catalyst ✦ Exit: Critical Path

LucidEra
B2B SaaS Data Analytics ✦ Benchmark ✦ Exit: Pentaho

Karelia
Consumer Productivity ✦ Apple Design Award for Innovation ✦ Bootstrapped ✦ Exit: Sun Microsystems

UserCreations
Consumer Infinite Canvases ✦ O'Reilly Media Award for Innovation, NY Times Feature ✦ Bootstrapped

Veriskope
B2B2C Video Commerce, B2B Streaming Media Server ✦ Bootstrapped

Robb Beal

Computational Products & Experiences

robbtbeal@gmail.com
https://www.linkedin.com/in/robbbeal/