



RAIKES SCHOOL
DESIGN STUDIO

2023-2024

From Innovation to Impact:

**Growing the
Next Generation of
Nebraska Leaders**



Design Studio Annual Showcase



› What is Design Studio?

In the heart of the Jeffrey S. Raikes School of Computer Science and Management lies Design Studio, the capstone program that brings leading industry sponsors, innovative startups, and researchers together with the best and brightest students to dream and build high-tech solutions for today's problems.

› Our Approach

As an experiential learning program, Design Studio engages third- and fourth-year students to solve real-world, technical problems by partnering with companies, startups, and organizations. A cornerstone of the Raikes School curriculum for more than 20 years, Design Studio is key to helping students see the impact of their work as they use their skills to deliver value to sponsors through hands-on projects.

› Find us at raikes.unl.edu/design-studio to partner with us on a project in Design Studio!

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Rob Nickolaus
Director of Design Studio

WELCOME to SHOWCASE

WE COMBINE INNOVATIVE MINDS IN BUSINESS AND COMPUTER SCIENCE TO MAKE AN IMPACT.

As I reflect on my first year as director of Design Studio, I keep reading this year's tag line and realize this is what our program is built to do best—grow impactful leaders using innovation. I am both proud and humbled by what has been accomplished this past year in Design Studio.

It is inspiring to see the projects crafted by the partnership of thought-leading industry sponsors, fueled by the drive of incredibly talented students, guided by Design Studio faculty and staff, and mentored by volunteer leaders resulting in high-impact solutions set to transform our community. It is impossible not to feel good about our future when you watch our students bring their tenacity and problem-solving skills to their projects and navigate through the necessary pivots, the celebrations and the setbacks, and the shared success with their sponsor, all with grace.

This would not be possible if it were not for the unwavering support and commitment of our sponsors, who continually push our students to their limits (and sometimes beyond) and foster real growth. Our sponsor's dedication to providing wicked challenges and supporting our teams through every obstacle is instrumental in nurturing the next generation of leaders and innovators. In addition, we owe so much to the contributions of our community of volunteers—coaches,

speakers, mentors, and advisors—who generously offer their time, expertise, resources, and guidance to support our students' growth and success. We are grateful for their commitment to Design Studio. Lastly, I wish to thank the staff, faculty, and University partners for their ongoing support and collaboration.

As you read this report and learn about the work that has been accomplished this past year, I urge you to engage with our students. Listen to their ideas and learnings. Celebrate their successes. Their passion, creativity, and drive are truly infectious, and I have no doubt they will continue to inspire us all. Similarly, reach out to our sponsors and volunteers. Thank them for their involvement and what they bring to Design Studio. If you are interested in learning more about Design Studio, please reach out to me or any of the Design Studio staff. We'd love to share our story.

As we conclude Design Studio for this school year, we are excited to see where the future will lead us. After this first year, I am more inspired than ever about the direction our program is heading and have only one question: "When can we get started?"

Year in Review



112

Students



30

Weeks Over
2 Semesters



20

Sponsors



20

Coaches



12-15

Hours
Per Week



4-6

Students
Per Team



5

Faculty



4

Research
Projects



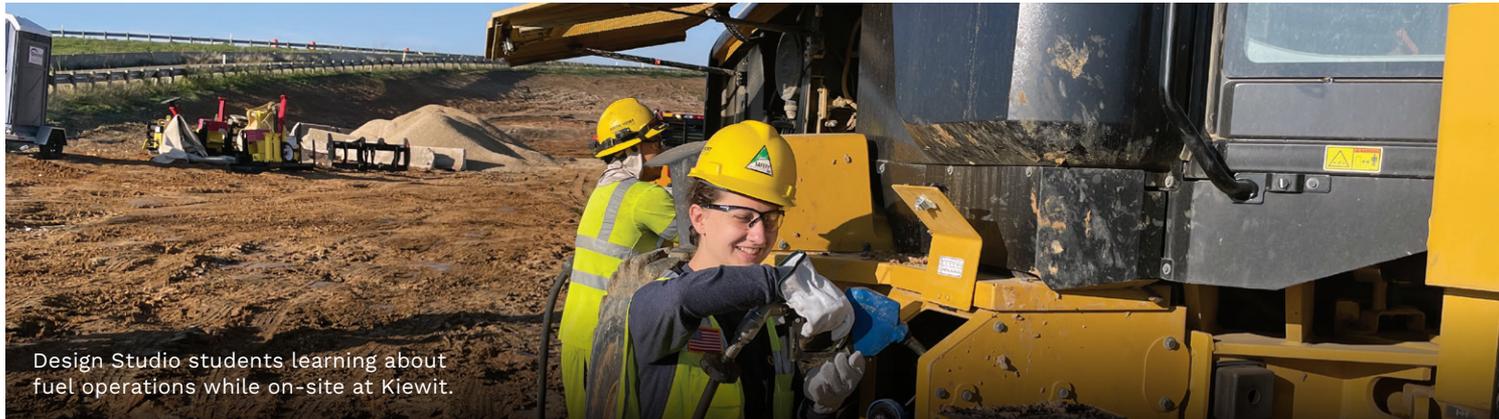
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Student
Startups

Design Studio Prepares Students for the Workforce by Emphasizing:

1. Project Management Skills
2. Leadership
3. Teamwork
4. Human-Centered Design
5. Business Value
6. Customer Discovery
7. Emerging Technologies





Design Studio students learning about fuel operations while on-site at Kiewit.

Empowering our Future Through Real-world Experience

These companies and organizations are leading the way to develop talent in Nebraska by providing challenging problems for our students to solve with proven and emerging technologies. The students gain the real-world experience of working as a fast and agile team. The sponsors get a fresh look at their business problems and new ways to solve them.



Allo | Page 10

Help ALLO evaluate market competition through adjusting terminal market share prediction with competitive landscape data to optimize business performance.



Allstate | Page 11

Utilize trend and anomaly detection to justify and monitor the use of computer vision models in improving Allstate homeowners' insurance.



Buckle | Page 12

Help customers and associates communicate and discover their clothing desires by developing a machine-learning algorithm that allows users to visually search for products from Buckle's clothing options.



City of Lincoln | Page 13

Empower local business owners and the City Clerk's office by creating a reimagined and streamlined digital permitting process, enabling more efficient interactions through an automated workflow.



DMSi | Page 14

Accelerate DMSi's customer help experience by equipping the support teams with an AI-powered knowledge retrieval tool.



Farm Credit Services of America | Page 15

Provide a machinery comparison tool for prospective buyers to streamline their research process through centralized data exploration and AI-powered synthesis.



FNBO | Page 16

Provide FNBO customers with intuitive tools to recognize, understand, and minimize their risk of financial fraud.



Hudl | Page 17

Provide an innovative sports analysis solution for field hockey, with the ultimate goal of enhancing the sport's accessibility and performance through advanced tagging workflows and insightful data modules.



Kiewit | Page 18

Create an intuitive mobile application that leverages telematics technology to deliver real-time fuel data, empowering construction teams to optimize efficiency and safety on job sites.



Medical Solutions | Page 19

Support Medical Solutions' traveling clinicians with their stress, burnout, and job satisfaction through an interactive AI assistant.



MICAH House | Page 20

Sponsored by Spreetail Foundation
Provide MICAH House with an easy-to-use and self-sustaining in-kind donation tracking system that streamlines data collection and helps foster stronger donor relationships.



Mutual of Omaha | Page 21

Create a more efficient data retrieval and analysis process for users, allowing them to view producer hierarchies and policy information associated with contracts provided by Mutual of Omaha.



Nelnet | Page 22

Provide Nelnet with an innovative algorithm-based matchmaking application to reduce time, cost, and effort of connecting recently displaced job seekers and employers.



NSAA | Page 23

Revamp NSAA's website to improve security, sustainability, and to help sports officials have a more fulfilling experience.



Olsson | Page 24

Empower Olsson to help clients understand and optimize their buildings and spaces through data-driven insights and recommendations.



Scoular | Page 25

Empower Scoular customers by increasing delivery schedule visibility and simplifying the order-editing process through an intuitive Web application.



Signature Performance | Page 26

Build an integration engine for Signature Performance to better connect healthcare payers and providers which will reduce administrative cost through interoperability.



STARTUP STUDIO

Thanks to generous support from private donors, three student-led startups became Design Studio projects this year based on their performance during a pitch competition the prior year. The goal of Startup Studio is to grant students the time and resources needed to focus on starting their own businesses while earning capstone credit, and to give others the experience of working at a startup. This spirit of entrepreneurship in turn inspires all students to lean into ground-breaking innovative solutions.



Cattle Kettle | Page 27

Deploy our integrated hardware solution and online platform into production, empowering ranchers to streamline operations and boost profitability through significant time and cost savings.



Dyslexico | Page 28

Make writing easier for everyone with dyslexia.



INFR | Page 29

Revolutionize the post-inspection process by seamlessly integrating a customer-centric workflow tool into existing processes, optimizing inspector efficiency, and streamlining the image management and recall experience.

➤ RESEARCH STUDIO

Research and innovation go hand-in-hand to drive new discoveries and solve real-world problems. This year, four of our students completed their Design Studio capstone by using their unique multidisciplinary skills to conduct research projects. Working with faculty mentors throughout the University, they helped fuel economic development for Nebraska and addressed challenges facing our state, our nation, and our world.



Mathematical Modeling and Analysis for the Dynamics of Zebra Mussels with Stage-Structure

Tan Phan | Page 30

Develop models to track and control the spread of zebra mussels, an invasive species.



EV Charging Station Placement and Economic Justice

Samuel DeZube | Page 31

Examine the impacts on EV charger placement in disadvantaged communities.



An Examination of Gaze Patterns of Novice and Expert Drone Pilots | Angeline Luther | Page 32

Extend existing research conducted at the NIMBUS lab on small unmanned aerial vehicle (sUAV) flying proficiency to understand the relationship between drone flying expertise and eye tracking movements.



Hidden Histories: Nebraska Women in Law from 1868 to 1950 | Clare Kramper | Page 33

Understand the circumstances that made it possible for women to practice law despite the lack of opportunity for female lawyers in Nebraska.

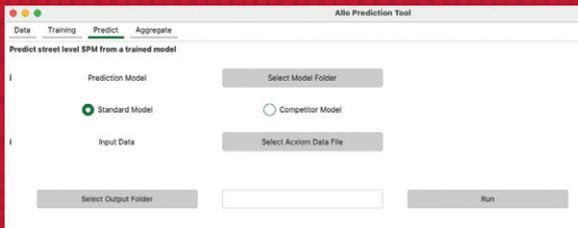


Market Share Predictor

ALLO is a Lincoln-based, all-fiber optic Internet, TV, and phone company. The company provides services to business, residential, and governmental customers in Nebraska, Colorado, and Arizona, and is swiftly expanding its footprint in these states.

With this growth expansion comes a desire from the business to better predict market share in these new locations to effectively allocate resources and maximize business performance. In the past, ALLO has partnered with the Nelnet data science team to develop a subscriber propensity model that is part of their market evaluation process. ALLO gave the Design Studio team an opportunity to build an improved model in-house and customize it toward ALLO's specific needs in order to increase employee understanding of the evaluation process and the markets they intend to enter.

To address this, the Design Studio team created the vision statement: "Help ALLO evaluate market competition through adjusting terminal market share prediction with competitive landscape data in order to optimize business performance." The solution included a combination of recreating Nelnet's previous model for ALLO to manage and adding new competitor data to the model to make it a more accurate representation of the markets being analyzed. This solution will allow ALLO to continue their expansion into new areas with a deeper understanding of vital market information and competing products in the area. With this, ALLO can be more confident they will see a return on the investment of their time and resources.



The tab of the pop-up display that allows users to choose a model and input data from which to get market share predictions.

| Prospective/Growing Markets (CO) | | | | | |
|----------------------------------|-------|-------|----------------------|----------------------|---------|
| Zip Code | State | SPM | SPM Upper Confidence | SPM Lower Confidence | SPM MDL |
| 80704 | CO | 0.623 | 0.508 | 0.508 | 0.0004 |
| Prospective/Growing Markets (NE) | | | | | |
| Zip Code | State | SPM | SPM Upper Confidence | SPM Lower Confidence | SPM MDL |
| 68944 | NE | 0.332 | 0.458 | 0.458 | 0.0012 |
| 68936 | NE | 0.342 | 0.485 | 0.485 | 0.0004 |
| 68901 | NE | 0.442 | 0.522 | 0.522 | 0.0018 |
| 68153 | NE | 0.234 | 0.508 | 0.508 | 0.0005 |
| 68104 | NE | 0.234 | 0.507 | 0.507 | 0.0003 |
| 68902 | NE | 0.365 | 0.374 | 0.372 | 0.001 |
| 68518 | NE | 0.673 | 0.467 | 0.468 | 0.0018 |
| 68528 | NE | 0.585 | 0.466 | 0.466 | 0.0005 |
| 68527 | NE | 0.378 | 0.461 | 0.465 | 0.0077 |
| 68526 | NE | 0.367 | 0.461 | 0.461 | 0.0002 |
| 68524 | NE | 0.467 | 0.488 | 0.488 | 0.0001 |
| 68522 | NE | 0.595 | 0.466 | 0.464 | 0.0005 |
| 68512 | NE | 0.491 | 0.483 | 0.483 | 0.0003 |
| 68983 | NE | 0.392 | 0.506 | 0.506 | 0.0005 |

Aggregated output showcasing market share prediction in various cities.



The team used Python, Pandas, Tensorflow, Tkinter, and Beautiful Soup while determining how to best predict market share.

TEAM

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Carly Gove
Aditya Jain

Cole Niebur
Viet Ninh

Aerial Insights Monitoring Dashboard

Allstate is one of the largest insurance companies in the country, offering a wide range of insurance products including homeowners insurance. When evaluating new properties for insurance policies, Allstate has begun to integrate the use of aerial imagery.

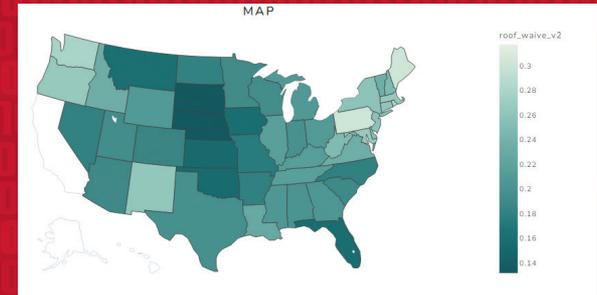
Using aerial imagery, the D3 Location Insights team at Allstate has developed computer vision models to gain property insights, better assess risk, and automate decisions at scale. Currently, there is no automated system in place to monitor and understand trends of model insights. Without such a system, it is also challenging to promptly identify sudden shifts in model predictions, which could erode trust among data consumers. Because of this, users of these aerial insights end up spending a lot of time manually exploring and validating the data to better understand model predictions and trends.

The Design Studio team sought to provide a solution to increase trust and understanding in the models by building a dashboard to visualize trends and distributions of the data over time. This solution will empower the D3 Locations Insights team to monitor their own models and ensure continued model performance. Further, the dashboard also allows users across the company to quickly and easily access aerial insights for individual properties; enabling greater understanding on why a given computer vision decision was made. The dashboard also provides time and geographic filtering for users who may want to hone into specific time ranges or states.

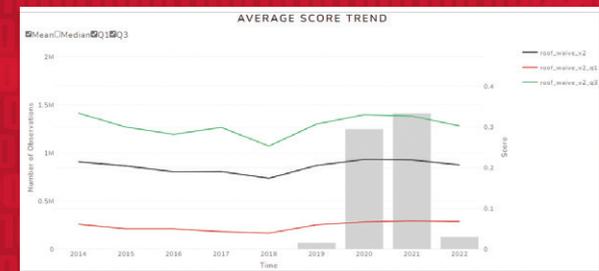
TEAM

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Jack Rankin

Emma Wagner
Elizabeth Weber



A heatmap of average roof waive scores by state. This helps users understand score levels across geographies.



Trendline of roof waive scores across time. This helps users quickly identify any model drift or changes.



An example of a property level view. This helps users determine if a property score is accurate.

Buckle

Visual Product Search

Buckle, Inc., stands as a premier destination for fashion-forward young men and women, offering an exquisite range of medium to high-end casual apparel, footwear, and accessories. Nestled in the heart of Kearney, Nebraska, its headquarters oversee the operations of 440 stores spread across 42 states, making it a Nebraska staple, present both at home and nationwide.

This past school year, the Buckle Design Studio team took on the task of developing a visual search model to advance product discovery and enhance guest satisfaction. The current system in place makes quickly and effectively describing and finding the clothes one wants difficult at times, with words not quite conveying what a

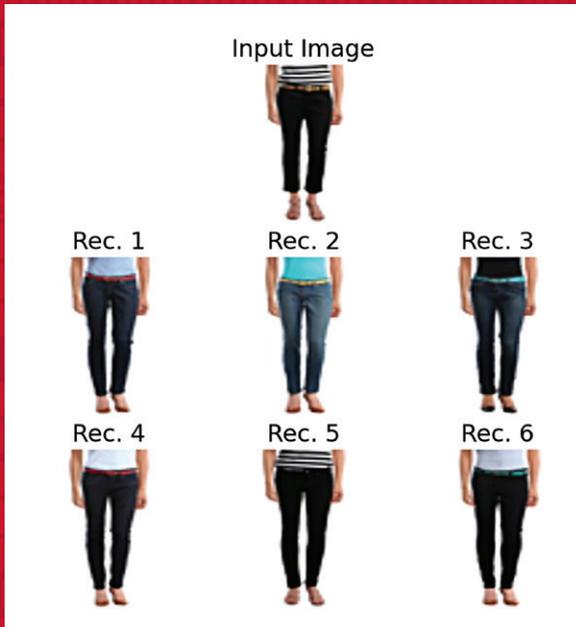
customer is looking for or what is similar within the Buckle catalog. Through this collaboration, Buckle hopes to elevate the shopping experience by seamlessly integrating visual product search capabilities into their existing applications. This innovative approach enables guests to effortlessly explore visually similar Buckle products by capturing a photo. Powered by a computer vision model utilizing Buckle's extensive product imagery, an easy-to-integrate API facilitates the rapid identification of visually akin items to the captured photo within the Buckle catalog. Through integration with Buckle's existing applications, a quicker, more effective clothing search process is enabled.



Semantic segmentation model isolating the photo's primary piece of clothing: jeans.



Pair of Buckle Jeans.



Product recommendations for the customer.

TEAM

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Carl Olson

Digital Front Door for the City Clerk's Office

The Office of the City Clerk serves as the primary point of contact for individuals seeking to do business with the City of Lincoln. Many interactions begin with acquiring a permit, from a holiday lights display to opening an outdoor café.

The current permitting process on the City's website involves customers printing and filling out a PDF permit, which they then email to the City Clerk's office and go in person to pay. This affects both new applications and renewals, causing complications through repeated information submissions and in-person visits, inconveniencing customers. A lack of a centralized permit location causes customers and City Clerks inefficiencies. With permits arriving through email, there are long wait times for approvals as permits often need to be returned due to missing information.

The Design Studio team was tasked with improving the current permitting process prioritizing efficiency and process visibility.

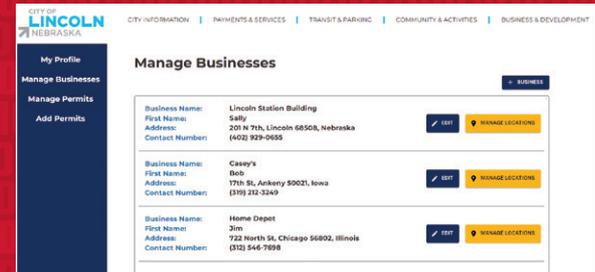
The team developed an online platform consolidating permit submission and approval for customers and City Clerks while providing insights into where permits are in the review process. Customers can create accounts to save business information and past permits, allowing for data to be automatically filled in and making the application process simpler. This platform validates entered information in real time to reduce the risk of submitting incomplete or incorrect permit applications. Once submitted, City Clerks receive the permit in an easily reviewable format.

The City of Lincoln would like a new platform to become the foundation for a final product that would simplify the review process. Automating several manual tasks frees up staff time, adds transparency to the review process, and reduces the risk of applications being delayed.

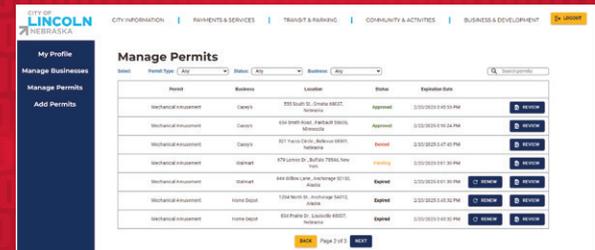
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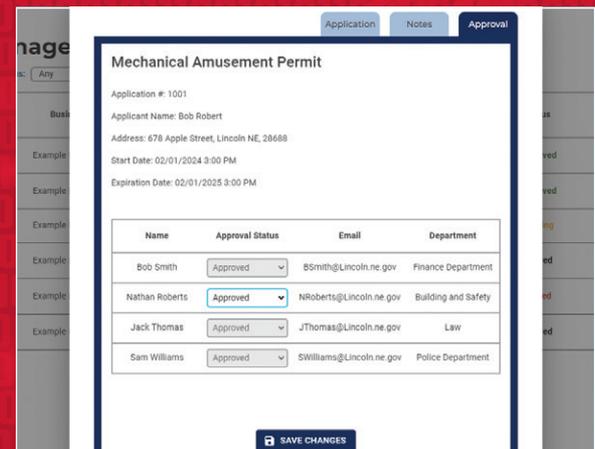
Joey Ng
Blake Simpleman



This page allows customers to save business information to be used when applying for permits.



On the manage permits page, customers can review, edit, and renew their permits.



This page facilitates permit reviews, enabling reviewers to promptly process and return them to customers.



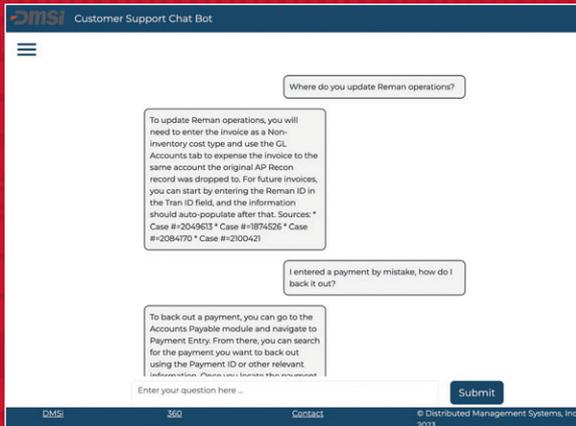
AI Chatbot Tool

Distribution Management Systems, Inc. (DMSi) is a software company specializing in providing software systems to assist companies in managing their distribution operations, inventory control, sales, purchasing, accounting, and other related processes. The current CRM system is an internally developed Web-based tool referred to as 360. Customers submit questions via a customer portal, email, or phone call, all captured as Case data within the 360 programs. This data includes the customer's original question and a tailored answer from a support representative.

The challenge of the project was to create a tool to aid the support staff in answering clients' questions. One measurable is to decrease mean time-to-resolution (difference between the Case Creation Date and the Support Phase Closed Date) by 50%. The proposed solution was a fully deployed AI-powered chatbot embedded into DMSi internal environments.

Much of the beginning of development was spent familiarizing the team with the tech stack, most of that time towards learning Dataiku, a software platform recommended by DMSi that specializes in data science and machine learning. The Design Studio team worked across various development areas, including the React front-end, building a data pipeline in Dataiku, and researching how to connect and fine-tune a model through OpenAI's GPT 3.5 large language model.

After being developed, these separate products were connected, and the model was tested through meetings with customer support staff and being posed with typical consumer questions of varying difficulties. From then, the product was handed off, with documentation to support the staff onboarding the product.

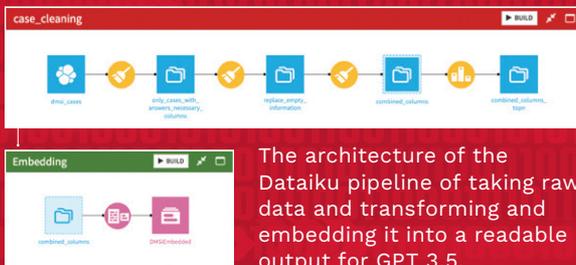


An example conversation between customer support staff and the chatbot working towards answering a consumer's question.

Script output on 18,000 rows (LP 5079)

| Category | Subcategory | Case Description | Case # | Answer |
|------------------------|----------------------|--|---------|--|
| string | string | string | string | string |
| Text | Text | Natural Lang | Integer | Natural Lang |
| General Ledger | Journal Entry | Invoices have been made for today, but have been l... | 2101800 | The GL postings would need to be reversed into th... |
| Pricing | None Specified | We are trying to reference an old case from 2014 th... | 2101785 | We were able to find the case, but it did not have in... |
| Agility Mobile WH T... | None Specified | We are starting a discussion, again, about the mobi... | 2101779 | Opportunity was created and sent to sales team fro... |
| Forms | Purchase Orders | Mimecast Attachment Protection has deemed this f... | 2101773 | Unfortunately there isn't much we can do to edit th... |
| SPO | None Specified | Getting an error when creating a Direct order Click ... | 2101771 | To get the PO to process you will need to double cl... |
| OrderPad | None Specified | We have a user that is unable to search for items in ... | 2101764 | The user had the check box for "Template Only" ch... |
| EDI | None Specified | We noticed that there are a few records that do not ... | 2101762 | System Admin: Mass updates: Copy/Update Record... |
| System Administra... | Automated Processing | Ray called in wondering if we archived any records... | 2101759 | Showed where to find the Aged trial balance report... |
| System Administra... | User Profiles | Deborah Chambers needs access to the sales agent... | 2101755 | Found that the user had the menu denied on the w... |
| Agility/ICTA Forms | Payment Receipt | Hi Bobbi, The DMSi logs is printing very large on ou... | 2101754 | Payment Receipts now process as storm because o... |

An example dataset of cases being cleaned within the pipeline.



The architecture of the Dataiku pipeline of taking raw data and transforming and embedding it into a readable output for GPT 3.5.

TEAM

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Machinery Match – Your Ultimate Farm Equipment Guide

Farm Credit Services of America (FCSA) is a customer-owned financial cooperative that provides financing for farmers and ranchers in the lower Midwest. FCSA was looking for a resource to provide their customers and potential customers with a method to find the best farm equipment for their farming operation based on their specific needs and key factors. Through customer research, it was discovered that most dealings were completed in person and were strongly dependent on personal relationships with dealers. The largest issue encountered during the purchasing process of farm equipment was the research process, where farmers can become confused with recent technologies and new offerings.

To combat this issue for FCSA, the Design Studio team imagined a website where easy comparisons could be swiftly made between a wide range of tractors, one

of the most important pieces of farm equipment. To achieve this vision, FCSA desired a solution that primarily utilized a generative artificial intelligence model. This project was an ideal use case for summarization and data comparison, which generative AI excels at.

Not only has the Design Studio team provided a functioning comparison website for tractors that can later be expanded to different types of equipment, they also provided a comprehensive learnings document and many recommendations regarding generative AI. This research has provided FCSA with a wealth of knowledge to tackle any generative AI-related ventures in the future. The research provided has created just as much value potential as the Machinery Match website, enabling FCSA to consider a wide breadth of future projects.

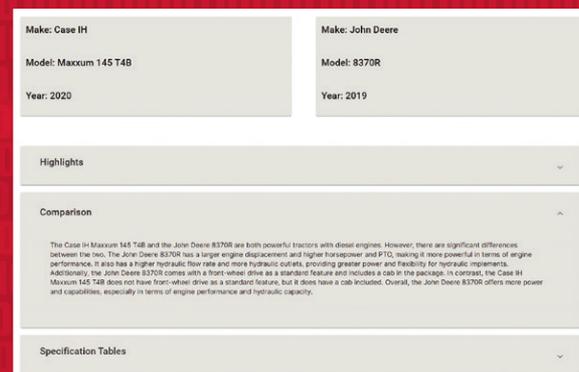
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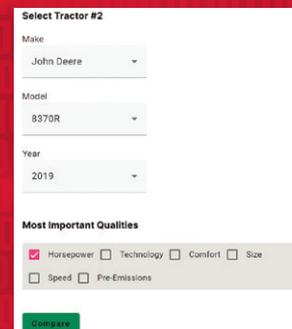
Emma Mirnic
John Post



A view of the tractor comparison interface, providing drop down menus for text-based summaries, highlights, and specification tables.



A closer look at the comparison output window generated for two tractors with the comparison text.



A closer look at the selection interface of the website to smoothly pick two tractors and select criteria most important to the user.



FraudSmart Toolkit and FraudIQ Score

First National Bank of Omaha (FNBO) is the largest independent, family-owned bank in the U.S., headquartered in Nebraska. Its mission remains to help individuals and communities improve their financial well-being.

Financial fraud is a rising and ongoing threat affecting customers of all banks. Most fraud tools are reactive, and simply address negative consequences after a fraud-related incident has occurred.

The Design Studio team was challenged to create a product that takes a proactive approach to combating fraud, one that provides customers with intuitive tools to recognize, understand, and minimize their risk.

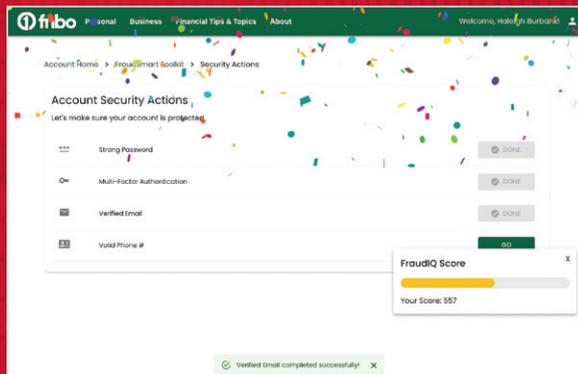
The team built the FraudSmart Toolkit dashboard, including a FraudIQ score, which is determined by a customer's actions. This Toolkit gives customers a "home base" to strengthen their account security and interact with educational resources, which can increase their FraudIQ score. Through extensive customer discovery and user testing, the team has implemented various "gameification" features and user interface design strategies to improve the customer experience with the FraudIQ Score and FraudSmart Toolkit, with the goal of reducing financial fraud and its devastating consequences.



The user's FraudIQ Score, signifying their level of fraud defense.



Interactive wheel indicating the user's account security status and actions they can take to improve it.



Various security actions that a user can take to improve their FraudIQ Score and confetti rewarding user activity.

TEAM

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Lauren Kasperek

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Jay Selzer

Hudl Assist for Field Hockey

Hudl is a pioneer in performance analysis technology, now helping more than 200,000 teams in 40+ global sports prepare for and stay ahead of the competition. More than 6 million users utilize Hudl's best-in-class software, hardware, and services, including online coaching tools, mobile and desktop apps, smart cameras, analytics, professional consultation and more.

Hudl Assist is a component within Hudl's suite of analytics products. Hudl Assist helps save coaches up to 800 hours a year by tagging meaningful moments in game video. This year, the Design Studio team worked on adding field hockey as the tenth sport available on Hudl Assist.

The Design Studio team began by researching field hockey and conducted consumer interviews with high school coaches from across the country. Using

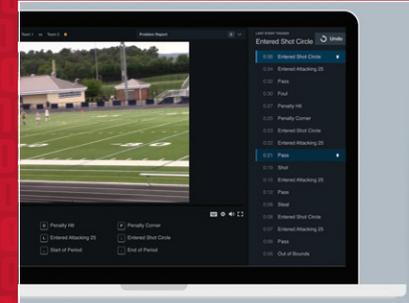
these insights, the team moved to developing a tagging workflow that allows Hudl analysts to successfully tag the moments that matter in a field hockey game. This tagging workflow allows game breakdowns that were essential for the development of the coach-facing insights module. The team crafted mockups and held customer interviews to identify the key game window for clip arrangement and the most valuable insight modules.

Drawing on feedback from internal Hudl analysts and coaches, the Design Studio team effectively created a prototype for a field hockey tagging workflow and a coach-facing interface. This prototype was then handed over to the Hudl development team for alpha testing, with the aim of assisting coaches in analyzing the moments that matter in a field hockey game.

TEAM

Madelyn Craft
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B Littman

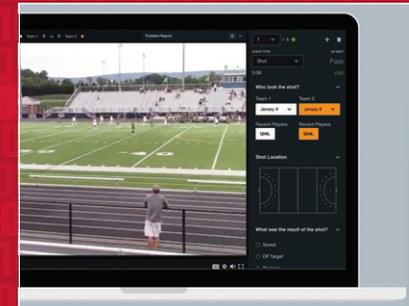
Jayden Rocha
Colin Safford



Event Phase

- First Phase of Analyst Interface
- Time-stamping critical moments
- Timeline Creation
- Analysis Support

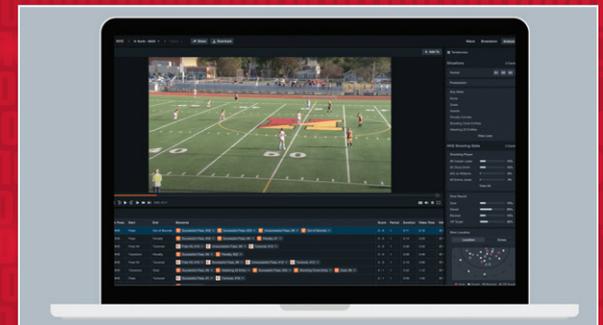
Analysts tag key game moments using keyboard shortcuts in the Event Phase of the workflow.



Context Phase

- Second Phase of Analyst Interface
- Detail Addition
- Action Attribution
- Tagged Event Enrichment

Analysts add context to the key game moments through the Context panels for each event.



Mockup of coach-facing interface that enables at-a-glance viewing and video filtering.



Visualizing Equipment Fuel Level

Kiewit is a global leader in construction with over 9,000 off-road equipment assets. They utilize telematics devices to collect fuel data and equipment operating hours. Kiewit recognized an opportunity to harness data to drive significant improvements in efficiency and safety, particularly in fueling and greasing operations. The vision of this project was to create an intuitive mobile application that leverages telematics technology to deliver realtime fuel data, empowering construction teams to optimize efficiency and safety on job sites.

The Design Studio team set out to create the application with a focus on delivering up-to-date, accurate data through a user-friendly interface. A new database was established, enabling faster data retrieval through more efficient API queries. Additionally, for equipment lacking telematics devices, a calculation was

developed to record fuel data manually. This process features an administrative website designed for supervisors to input essential information, such as the operational hours possible on a full tank and greasing intervals.

Upon finalizing the backend infrastructure, the team worked on a simplistic front-end featuring two modes: driving and fueling. The driving mode offered fuelers the ability to see a site-wide overview to better plan their routes. The fueling mode offers equipment details and buttons for fueling and greasing, allowing fuelers to accurately update data ensuring the effectiveness of the product.

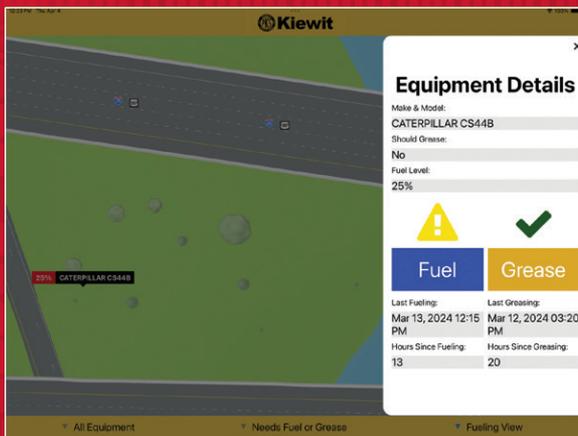
This integrated approach ensures that accurate data is readily available to fueling technicians, enhancing both efficiency and safety on construction sites.



The Overview page shows every asset on a Kiewit site with clustering for efficient management.



The Driving view identifies assets needing fuel or grease for streamlined tasks.



The Fueling view provides a focused view of that map and provides specific equipment details.

TEAM

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Kyana Le

Alex Miller
Hamdan Sayeed

Leveraging AI To Improve Clinician Wellbeing

Medical Solutions is one of the nation’s largest healthcare talent ecosystems, connecting nurses and health clinicians with healthcare systems nationwide. Medical Solutions creates technologies for the healthcare staffing industry, enabling hospitals, clinicians, and recruiters to increase care. Medical Solutions’ products include an app for travel clinicians to search and apply for jobs, manage credentials, connect with recruiters, and a platform for hospitals to recruit, hire, retain, and manage clinicians. Traveling clinicians face unique challenges, including increased stress, isolation, and burnout. Before this project, these issues were addressed through dialogues with recruiters, an increasingly complex strategy as the number of clinicians and recruiters grows.

To address this, the team developed an AI-driven mental wellbeing assistant for traveling clinicians employed by

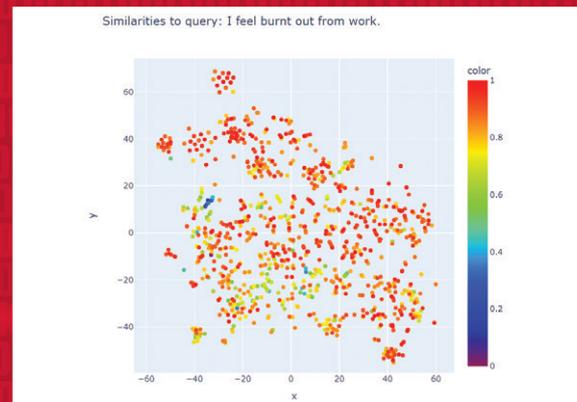
Medical Solutions. Delivered via a Web application, a clinician can chat with the bot about their mental health and wellbeing. The bot then replies with a sympathetic tone, emphasizing active listening. It will refer clinicians to appropriate resources for their struggles, such as their Medical Solutions recruiter, using a retrieval-augmented generation system to incorporate Medical Solutions-specific data.

The objective of the AI assistant tool is to reduce burnout and, consequently, turnover by providing an early intervention tool that can address some of the mental health needs of clinicians. As the AI assistant helps clinicians navigate their wellbeing, job satisfaction can improve while clinician burnout rates fall. This can also save costs associated with hiring and training new staff and increase satisfaction among the hospitals Medical Solutions serves.

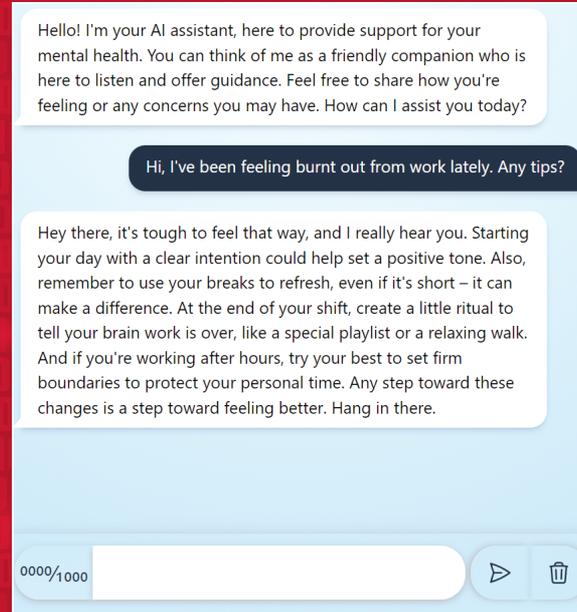
TEAM

Mohammad Al-Robaie
Roy Dumblauskas
Sophia Hill

Cooper Sheets
Zachary Wallenburg



Representation of similar responses to a user’s prompt, colored based on similarity. A nearby point might include “resources for burnout.”



Example conversation between wellbeing assistant and traveling clinician.

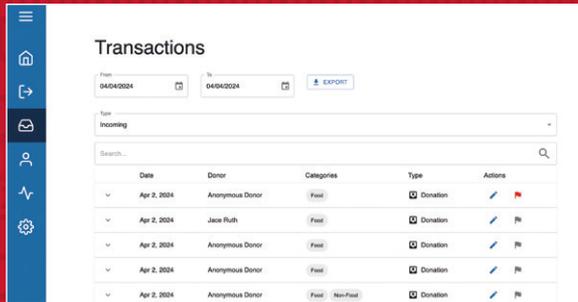
In-kind Donation System

MICAH House is a nonprofit homeless and women's shelter servicing the Omaha and Council Bluffs area. Founded in 1986, MICAH House provides both shelter and support services to hundreds of children and adults annually. Like many nonprofits, MICAH House is run on the generosity of monetary and physical donations. The physical donations, or in-kind donations, include items like food, toiletries, bedding, linens, and clothing.

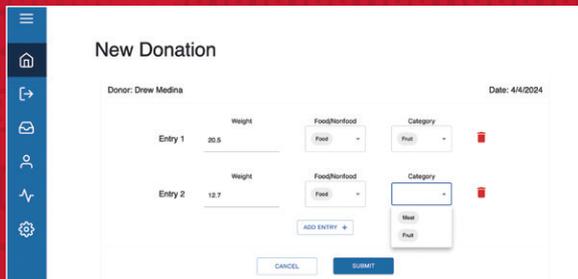
Currently, when MICAH House receives an in-kind donation, the items are weighed and then a carbon copy receipt is written and all information about the donation is tracked by hand. All the written information is eventually transferred to an Excel spreadsheet at the end of month. These spreadsheets are then used to perform audits and

apply for grants. This outdated and analog way of tracking donations is time-consuming and due to the lack of information, doesn't help to build connections with recurring donors.

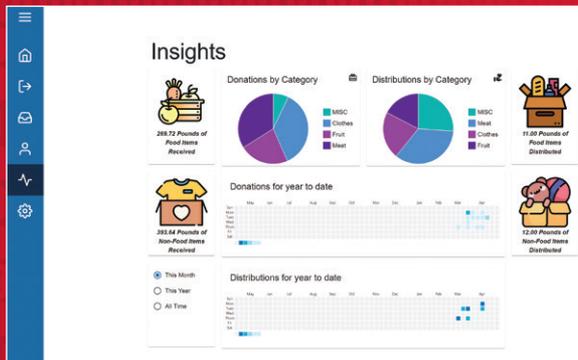
The Design Studio team's solution is a personalized software platform that can track the weights and categories of in-kind donations, while also keeping track of donor information. This software application helps to streamline the data collection process of donations, while also allowing for stronger relationships to be built with these donors. With this application, MICAH House will be equipped to track all in-kind donations by type and amount, as well as donor information, making it simple and easy to complete internal audits and apply for grants.



Transactions page: The main page of the application. Here the user can see and filter all donations.



Donation form: The form that donors fill out as they are completing their donation.



Insights page: A page that displays data analytics of the donations.

TEAM

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Trinity Mozingo
Chaitra Pirisingula

Max Radlicz
Jace Ruth

Policy to Producer Sales Association User Interface

Mutual of Omaha is an insurance and financial services company which aims to aid its customers in protecting what they care about and achieving financial security. Internally, Mutual of Omaha has many internal operations which work with sensitive data, necessitating secure data handling.

The Design Studio team was challenged with facilitating internal access to sensitive data while enhancing its readability for Mutual of Omaha associates. Business analysts frequently require access to customer and policy information. The current process, which lacks direct access to AWS databases, often results in communication errors and consumes valuable time. This time gap between the analyst's request and the actual receipt of information, coupled with the diversion of resources from other tasks, posed a significant issue.

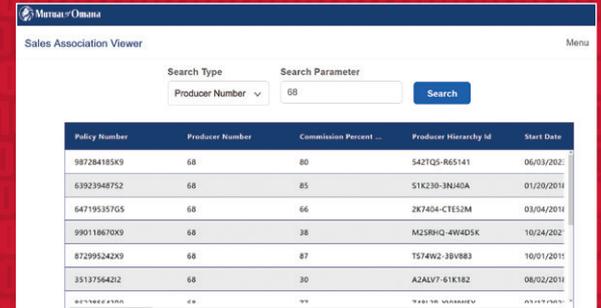
To tackle this challenge, the team devised a highly accessible and secure front-end application linked to Mutual of Omaha's AWS databases, enabling associates to access the desired information on demand. The creation of a user-friendly table and intuitive search functionality streamlined internal data retrieval, making it swift and efficient.

With this application in place, Mutual of Omaha stands to save considerable time and enhance associate productivity. The framework established by the team allows for the introduction of new functionalities, such as table editing capabilities, and the expansion of access to a larger pool of internal associates as needed. Looking ahead, Mutual of Omaha can leverage this framework to further integrate the retrieval of sensitive data, ensuring continued efficiency and security.

TEAM

Charlie Fulks
Nick McElroy
Emily Nau

Garrett Parker
Divsirat Singh

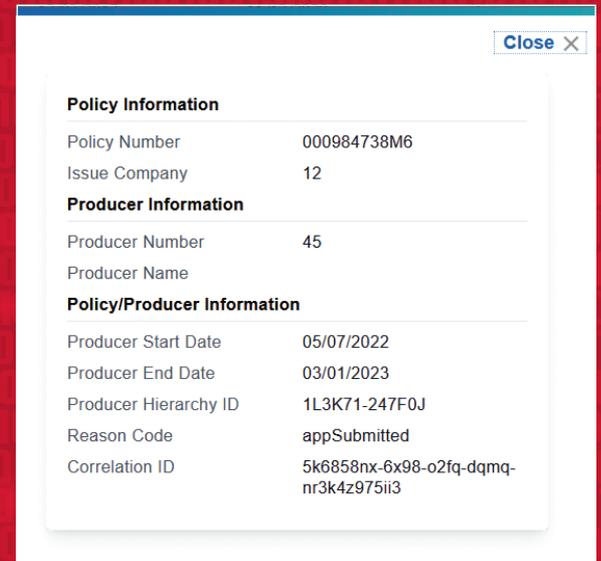


Sales Association Viewer

Search Type: Producer Number | Search Parameter: 68 | Search

| Policy Number | Producer Number | Commission Percent ... | Producer Hierarchy Id | Start Date |
|---------------|-----------------|------------------------|-----------------------|------------|
| 98728418583 | 68 | 80 | 542705-865141 | 06/03/2022 |
| 63923948752 | 68 | 85 | 51K230-3N405A | 01/20/2011 |
| 64719535705 | 68 | 66 | 2K7404-CTE52M | 03/04/2011 |
| 990118670X | 68 | 38 | M2SRHQ-4W4DSK | 10/24/2022 |
| 872995242X | 68 | 87 | T574W2-3BVB83 | 10/01/2011 |
| 3513756422 | 68 | 30 | A2ALY7-61K1R2 | 08/02/2011 |

The table view allows for search and filter functionality making data retrieval simple and smooth.



Close X

| Policy Information | |
|-----------------------------|-------------------------------------|
| Policy Number | 000984738M6 |
| Issue Company | 12 |
| Producer Information | |
| Producer Number | 45 |
| Producer Name | |
| Policy/Producer Information | |
| Producer Start Date | 05/07/2022 |
| Producer End Date | 03/01/2023 |
| Producer Hierarchy ID | 1L3K71-247F0J |
| Reason Code | appSubmitted |
| Correlation ID | 5k6858nx-6x98-o2fq-dmq-nr3k4z975ii3 |

The modal allows associates to view policy information in a more succinct and easier to read format.



ProPair: Job Connection Platform

Nelnet is a Lincoln-based service company specializing in student loan servicing, consumer finance, telecommunication, and K-12 and higher education. Nelnet Business Services, or NBS, aims to address shortcomings in the education and employment sector using technology and community management solutions. Nelnet and NBS are focused on creating accessible products to strengthen individuals and empower their customers.

The Design Studio team was challenged to create a product to assist companies and jobseekers during the outplacement process. Through user interviews, the team found a gap in the process—hiring employers often seek specialized talent which exists in candidates who have recently been displaced from their jobs. Another opportunity for improvement is the use of technological solutions, which is what the team aimed to address.

The team designed ProPair, a job connection platform inspired by dating apps. Specifically, their sophisticated

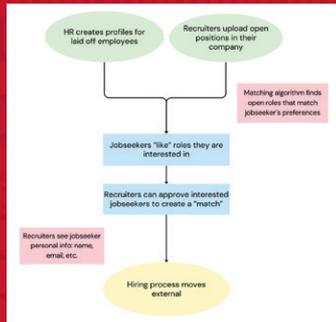
algorithms are presented through simple interfaces. The objective of ProPair is to facilitate an easy connection between jobseekers and employers. ProPair is comprised of a simple user interface, a sophisticated matchmaking algorithm, and a scalable backend infrastructure. ProPair caters to two types of users: recently displaced jobseekers and company representatives, like recruiters. Each user is presented with individuals of the opposite party that match their preferences. They then can connect for phone screens, interviews, and discussions.

Ultimately, this eliminates the need for third-party platforms like LinkedIn or Indeed, which can feel cluttered and tedious for displaced jobseekers. Overall, ProPair provides value by streamlining job placement, offering opportunities to those navigating unpredictable career paths post-layoffs. It is a simple solution for company representatives looking to source specialized talent.

TEAM

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Shivani Mudhelli

Hannah Pokharel
Jack Smiley



The user flow of ProPair mimics that of a dating app, showing jobseeker potential roles that suit their preferences.

Software Engineer Manager at WebCraft Good Match

Role Description: WebCraft, a global leader in technology, is seeking a dynamic and experienced Software Engineer Manager to join our innovative team. In this role, you will lead and mentor a group of talented software engineers, driving the development of cutting-edge solutions that power the future of financial services. If you're passionate about technology, possess excellent leadership skills, and thrive in a collaborative environment, we invite you to be part of WebCraft's mission to shape the future of fintech. Join us in creating solutions that make an impact in the world of digital finance.

Skills Desired: React, Node.js, JavaScript, Product Management

About the Role

| LOCATION | DATE POSTED | EXPECTED SALARY |
|-------------------|-------------|------------------|
| Lincoln, Nebraska | 9/20/2023 | \$0000 to \$0000 |

| INDUSTRY | LOCATION TYPE |
|----------|---------------|
| Retail | Hybrid |

[IGNORE](#) [LIKE](#)

The browse page uses results from the matching algorithm to show a jobseeker which roles suit their preferences.

Search Criteria

Information in this section will be used to find potential matches.

Location:

Preferred location type(s)

Remote In person Hybrid

Former Role:

Salary Range: \$70,000 - \$80,000

Minimum Match Level: Average

Skills:

Add Skills:

[GET RECRUITS](#)

Former Software Engineer at Tech Innovations Inc.

Former Role: [View Profile](#)

Match Preference: [Match](#) [Like](#)

Location:

[VIEW PROFILE](#)

Former Product Manager at Creative Solutions

Former Role: [View Profile](#)

Match Preference: [Match](#) [Like](#)

Location:

[VIEW PROFILE](#)

Former UX Designer at Design Studio

Former Role: [View Profile](#)

Match Preference: [Match](#) [Like](#)

Location:

[VIEW PROFILE](#)

Former Data Scientist at Big Data Analytics Ltd.

Former Role: [View Profile](#)

Match Preference: [Match](#) [Like](#)

Location:

[VIEW PROFILE](#)

The search page allows a recruiter to filter jobseekers by certain criteria, such as location and skills.



Project ZeroDelta

Olsson is an engineering firm with an office located in Lincoln's Haymarket. Project ZeroDelta aims to address Olsson's challenge of using 3D data for construction planning.

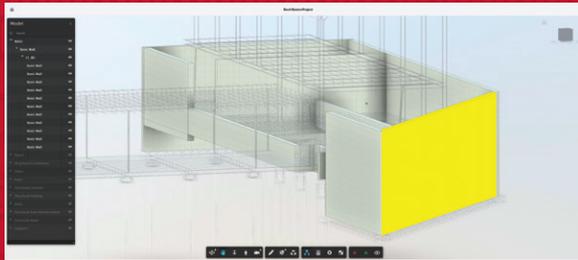
Olsson's engineers face the problem of time-consuming manual comparison of 3D blueprints to real-world construction. The comparison process involves engineers searching for differences, recording them, and reconciling them by editing designs. Currently, this manual comparison process can take several hours or even days and be subject to human error. Comparison is critical to Olsson's workflow ensuring the client is getting what was designed, the blueprint is updated to match reality, and errors are caught at the job site before they cause problems.

Project ZeroDelta's goal is to algorithmically compare and classify

points between the 3D models and their real world, or point cloud, counterparts. This helps engineers quickly find where the model needs to be edited faster, where reality doesn't line up with the planned model, and track construction progress.

The Design Studio team improved a previously created algorithm that detects model differences for increased accuracy. The team also built a Web viewer where Olsson can upload models and point clouds to see the results of the comparison. Lastly, the team successfully migrated the project from only running on a local computer to running on cloud infrastructure. This final piece was vital to making the program fast enough to be implemented at Olsson.

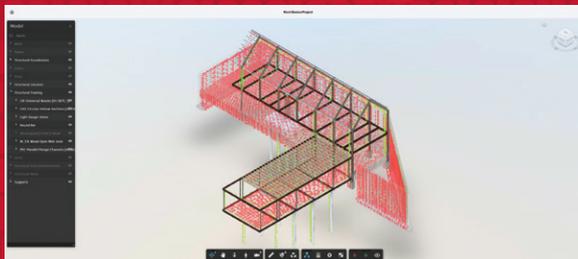
Project ZeroDelta in its current state helps Olsson engineers save time in their data comparison process.



ZeroDelta's viewer highlighting a wall where no points were detected.



ZeroDelta's custom viewer built on Autodesk Platform Services displaying the comparison model classifying points that correspond to 3D model.



ZeroDelta's viewer classifying points as outliers when there is no object detected with the point.

TEAM

Kellen Carney
Gleb Moissejev

Paul Owens
Carina Swanson

Feed Marketplace

Scoular provides agricultural supply chain solutions to customers around the world. Scoular buys, sells, stores, handles, and processes animal feed. The company has a global network that allows it to facilitate international trade and transportation of essential commodities.

Customers work with Scoular to establish a recurring schedule to deliver feed to their farms. Customers often want to make one-off changes to their scheduled deliveries or make recurring updates when they want feed delivered to their farms. Currently, customers keep track of their feed delivery schedules themselves, and rely on phone calls, emails, and text messages to request changes to their deliveries from Scoular. Scoular employees receive these requests from dozens of customers and have no consistent way of tracking different customer schedules and changes they have requested.

To address these challenges, the Design Studio team developed a digital application, designed to increase the visibility of a customer’s delivery schedule and simplify the process by which customers can request changes to their feed deliveries. Using Feed Marketplace, customers can view their current feed delivery schedule, request changes to specific or recurring deliveries and request new deliveries in an easy-to-use online platform.

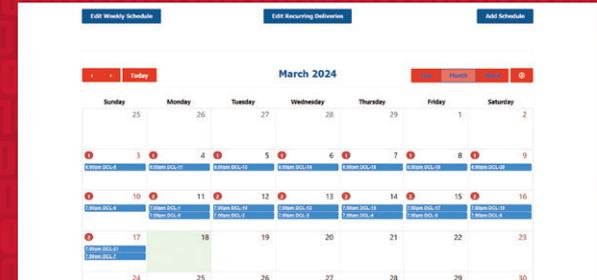
The application also provides Scoular employees with a portal to manage the various requests they receive from customers. These employees can view the requests, and approve, or deny them.

This digital solution will help optimize the feed delivery process for both Scoular customers and employees, enhancing operational efficiency and boosting customer satisfaction.

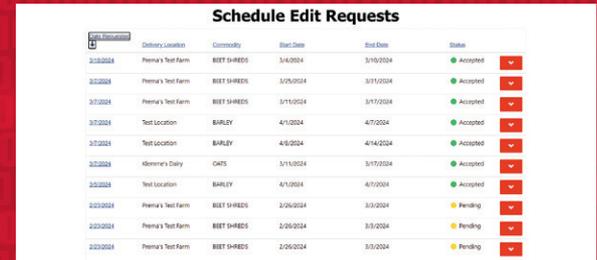
TEAM

Ealynn Hsu
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Natalia Trejo Andalon

Mitra Vajjala
Prema Vasudevan

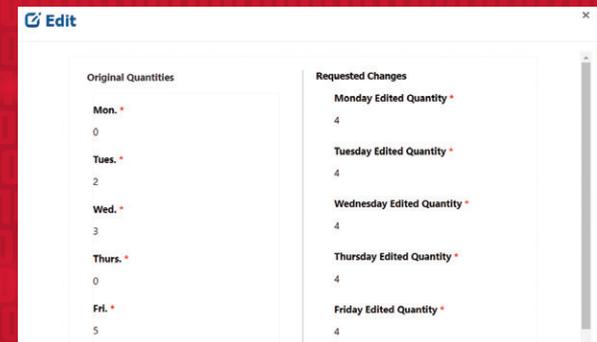


The Schedule Page: Displays the customer’s weekly feed delivery schedule, with the ability to easily request changes.



| Request ID | Delivery Location | Commodity | Start Date | End Date | Status |
|------------|-------------------|------------|------------|-----------|----------|
| 3-23-2024 | Prema's Test Farm | BET SHREES | 3/4/2024 | 3/10/2024 | Accepted |
| 3-23-2024 | Prema's Test Farm | BET SHREES | 3/26/2024 | 3/31/2024 | Accepted |
| 3-23-2024 | Prema's Test Farm | BET SHREES | 3/19/2024 | 3/19/2024 | Accepted |
| 3-23-2024 | Test Location | BARLEY | 4/1/2024 | 4/7/2024 | Accepted |
| 3-23-2024 | Test Location | BARLEY | 4/8/2024 | 4/14/2024 | Accepted |
| 3-23-2024 | Idemmer's Dairy | CATS | 3/19/2024 | 3/19/2024 | Accepted |
| 3-23-2024 | Test Location | BARLEY | 4/1/2024 | 4/7/2024 | Accepted |
| 2-23-2024 | Prema's Test Farm | BET SHREES | 2/26/2024 | 3/3/2024 | Pending |
| 2-23-2024 | Prema's Test Farm | BET SHREES | 2/26/2024 | 3/3/2024 | Pending |
| 2-23-2024 | Prema's Test Farm | BET SHREES | 2/26/2024 | 3/3/2024 | Pending |

The Request Table: A user-friendly interface for customers to view and manage their feed delivery change requests.



Scoular employees can review, approve, or deny customer change requests, and provide feedback through comments.

SMART on FHIR Interoperability Engine

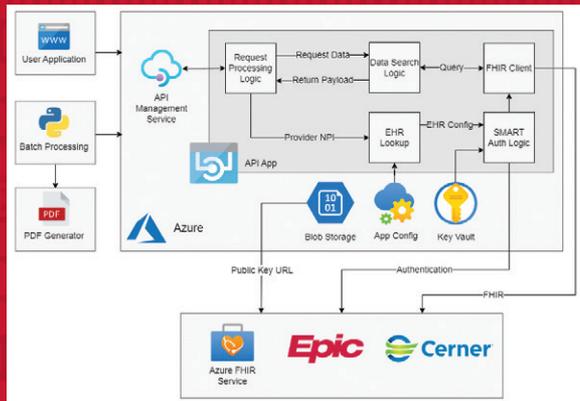
Signature Performance, Inc. is a leading healthcare administrative services company founded in 2004 with the vision of transforming the industry. Their mission is to improve the health of our clients' business and make the lives of the people we work with better.

Interoperability has been a challenge in the healthcare industry due to rigid regulations. This year, Signature Performance challenged the Design Studio team to develop a healthcare interoperability engine to streamline data exchange. The primary objectives included querying and extracting data from diverse Electronic Health Records systems (EHRs) and integrating seamlessly with Substitutable Medical Applications and Reusable Technologies (SMART) on Fast Healthcare Interoperability Resources (FHIR). FHIR is a next-generation interoperability standard created by the standards development organization Health Level 7 (HL7) which enables health data to be quickly and efficiently exchanged. The

end-product will optimize processes such as medical document retrieval.

The Design Studio team built an integration engine capable of connecting, querying, and extracting data from various EHRs, including EPIC and Cerner. The results of the extraction can be used in machine ingestions (JSON) or human-readable formats (PDF). The engine enables Signature Performance to exchange information with providers, payers, and systems from a centralized application. This results in reduced administrative costs and provides healthcare interoperability.

Leveraging the widely adopted HL7 FHIR standard, the integration engine automates manual processes, streamlines operations, and boosts revenue by promoting efficiency. Real-time access to patient data through FHIR integration improves clinical decisions, leading to enhanced patient outcomes and satisfaction. The integration engine stands as a valuable asset for optimizing Signature Performance's future healthcare operations.



A high-level overview of how the data flows in the system and various cloud services used for hosting.

An example of a user interface for doctors to search patients through the interoperability engine.

TEAM

Laurel Carder
Jessica Chen
Ellenna Divingzzo

Ryan Orth
Caleb Rosenboom



Cattle Kettle offers live monitoring and notification of tank conditions, reported to a Web app, that allows the rancher to see what’s happening at their stock tank from anywhere. Managing water for cattle, especially on pasture and rangeland, is expensive and time-intensive. Water is foundational for cattle health, and is incredibly important to monitor to support a cattle rancher’s livelihood. To do this, ranchers are driving to remote livestock water tanks or ponds and fixing any problems a water source may have. For some, that’s fixing a broken windmill. For others, that’s chopping ice. For most, that’s doing nothing at all. Ranchers don’t know what’s happening at the tank without being there and, currently, there are no measurable metrics. They spend a lot of time and resources managing water that doesn’t require it. This is where Cattle Kettle can help.

With Cattle Kettle, ranchers only take care of what they need to, and they get their time and money back—both incredibly important resources for family- and community-oriented people like ranchers. The Startup Studio team created the Cattle Kettle Web app, developed a basic prototype and a few iterations of the CK Monitor (the hardware measuring the water conditions), and raised \$115,000 in non-dilutive grant funding to support partnerships with engineering firms, harsh environmental product testing, and intellectual property protection. They also dealt with the challenge of designing for a unique user—cows. The team is looking forward to the commercial launch of the CK Monitor in January 2025.

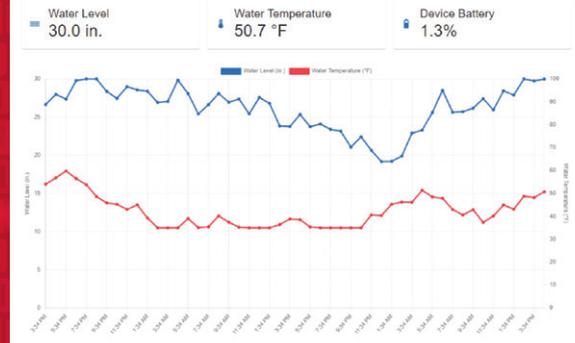
TEAM

Brooke Bode
Seth Daup
John Esser

Landry Geiger
Reed McHenry

Geiger Inc.

Bluff Basin



For each tank, ranchers can view the water level and water temperature. The graph provides a visualization of device readings.



A CK Monitor Test Device runs on a testing tank on campus for environmental testing and website coupling testing.



The team took second place in the inaugural Nebraska Governor’s – New Venture Competition, winning \$15,000—a fraction of funding raised.

Dyslexico

Dyslexico is a student-led startup that provides more accurate spelling and grammar corrections for people with dyslexia. Current educational tooling leaves dyslexic users behind and scrambling to adapt to software that is not made for them. Every unique mind deserves dignity and tools that help them reach their potential. By leveraging machine-learning technology, Dyslexico provides seamless spelling and grammar corrections that are tailored to the dyslexic mind.

In its second year as a Design Studio startup team, Dyslexico continued to develop its technology and business strategy. From a technical perspective, the Dyslexico team redesigned its homepage and account page to better serve its users, implemented analytics to improve educational outcomes for students with dyslexia, and developed a chrome extension to ensure Dyslexico is available wherever users write.

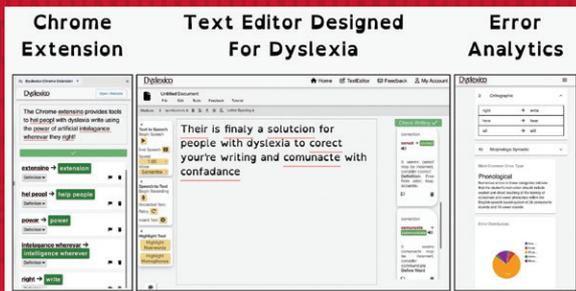
From a business perspective, Dyslexico focused on customer acquisition as a primary goal. In this vein, they sent monthly emails to foster business connections, developed social media accounts to reach a wider audience, and ran email campaigns to reach out to schools and community groups for people with dyslexia. Another focus was on funding post-graduation. From this, Dyslexico earned \$15,000 from pitch competitions and began valuations to seriously pitch to venture capitalists. Dyslexico also testified in support of LB1253, a bill that could provide up to \$1 million in grant funding for dyslexia research.

Through these steps, Dyslexico aims to provide the most accurate source of spelling and grammar corrections for people with dyslexia so they can communicate with confidence.

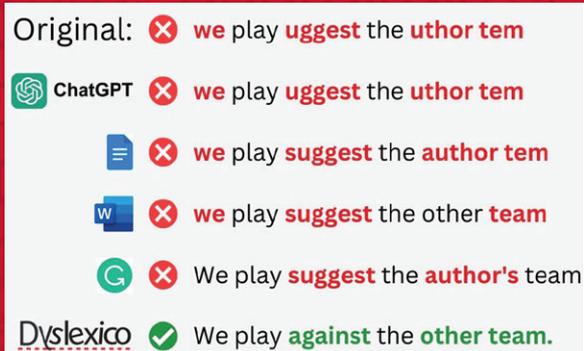
TEAM

Victoria Chin
Tristan Curd
Josh Feng

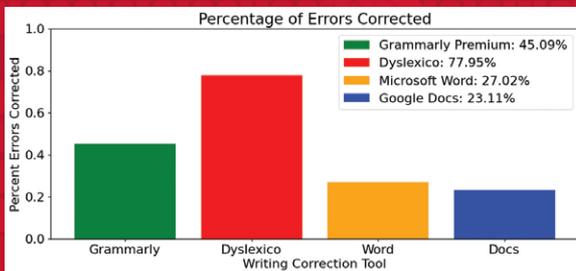
Santiago Giraldo
Nick Lauver
Bridget Peterkin



Students can use Dyslexico wherever they write through a Google Chrome Extension and receive personalized error reports.



Dyslexico is the only solution to get dyslexia-specific errors right while maintaining the user's voice.



Dyslexico corrects over 30% more errors than competitor spellcheck solutions for sentences written by students with characteristics of dyslexia.



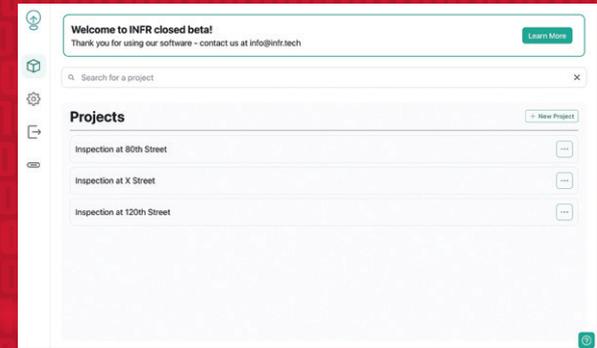
INFR is a startup dedicated to improving data management processes involving large image libraries. Bridge inspectors are busy engineers who spend a great deal of their time in the field. As these engineers inspect bridges, each bridge inspector takes up to a few hundred photos per bridge. Upon returning from each inspection, inspectors are often required to rename each of these images in a highly specific format to ensure the images can be accessed in the future. This process can take a few hours a week for each inspector and can be a dreaded task. Various customer groups experience the same problem as bridge inspectors and put significant effort into renaming images to manage their data.

This is a necessary, but tedious and time-consuming task that reveals a larger problem with data management. No tool exists to combine consistency in naming standards while allowing a unique name to be attached to each image to facilitate organization standards with large amounts of images. The INFR team developed a user-friendly workflow tool to largely automate the renaming activity, only requiring these professionals to enter the information specific to each image and automatically applying the remainder of the required format for the name. The INFR desktop app reduces the time to rename an image from 30 seconds, to just 7 seconds, giving engineers their time back to continue solving engineering problems, rather than performing tedious desk work.

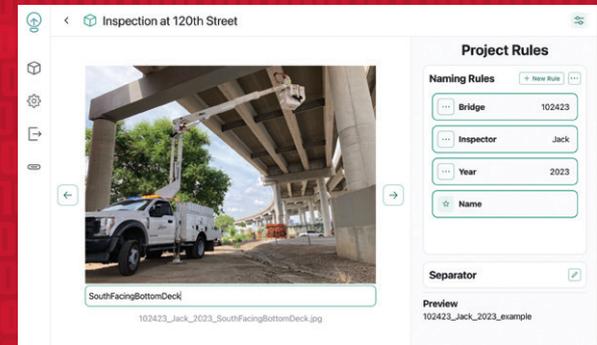
TEAM

Will Anderson
Kyle Auman
Bethany Barnwell

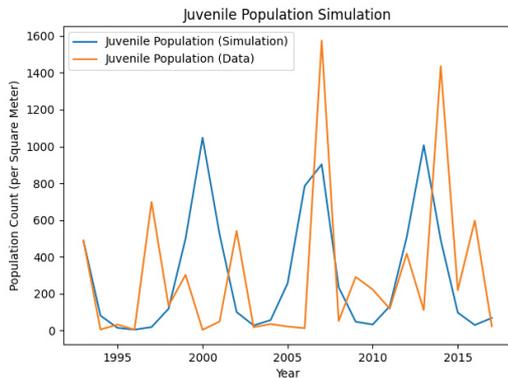
Brendan Shanks
Macy Wilson



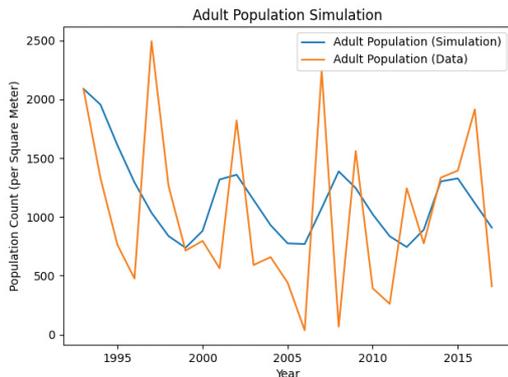
The homepage of the INFR application, showing the projects that a user has created.



The image carousel page, where users can create rules and rename their images.



Simulation of the juvenile population density compared to the observed population density in the Hudson River.



Simulation of the adult population density compared to the observed population density in the Hudson River.

Mathematical Modeling and Analysis for the Dynamics of Zebra Mussels with Stage-Structure

Zebra mussels are an invasive species of mollusk that originated in Europe near the Caspian Sea. The species were believed to have arrived in the Great Lakes in the late 1980s and are now found in numerous bodies of water across the U.S. Researchers suspect zebra mussels reached Northeastern U.S. via contaminated cargo ships. This is of concern, as zebra mussels can cause ecological and economic damage by competing with native species for resources and clumping together to clog water intake pipes in various facilities, such as power plants. Current control strategies involve cleaning and drying ships after travel. However, these strategies are challenging to implement successfully with smaller zebra mussels that are difficult to spot with a human eye.

To better understand the issue, the team developed a discrete, non-spatial, and stage-structured model to measure population dynamics of

zebra mussels, consisting of juveniles and adults. The researchers found the trivial and positive equilibrium of the model and analyzed the stability of the equilibrium. The researchers used the net reproductive rate R_0 to understand the long-term state of the mussel population. Biologically, R_0 represents the average number of offspring an individual mussel can reproduce over its lifetime. The researchers proved the following results of their model:

- (i) If $R_0 < 1$, the population will become extinct.
- (ii) If $R_0 > 1$, the population will persist.

The model was also fitted using pre-existing data from the Hudson River to simulate future population evolution. The project also involved running simulations to test how different factors, such as water temperature, affect the net reproductive rate, and hence the long-term dynamics of a zebra mussel population.

TEAM

Tan Phan

Dr. Yu Jin, Associate Professor, UNL Department of Mathematics

EV Charging Station Placement and Economic Justice

In 2022, Dr. Ibrahim Çapar and Dr. Özgür M. Araz were working on optimization “electric vehicle charging network design with capacity and service considerations.” This work was published in the Institute of Industrial and Systems Engineers (IISE) Transactions Journal in July of 2023. This prior research led them to question if there was a way to optimize EV charger placement for socioeconomic justice on top of service and capacity considerations, inspired by the White House’s Justice 40 Initiative.

Teaming with Dr. Tammy Beck, we explored prior research and various data sources including the US Census,

CDC’s Environmental Public Health Tracker, and the Justice40 Initiative. We explored data at the state, county, and census tract level, assessing various relationships between social vulnerability and socioeconomic factors with the placement of electric vehicle charging stations. Despite extensive analysis, our findings did not show a significant impact of EV charging stations placement on socioeconomic improvement. This research contributes to ongoing discussions and analysis on how to integrate economic justice into infrastructure planning for a sustainable future.

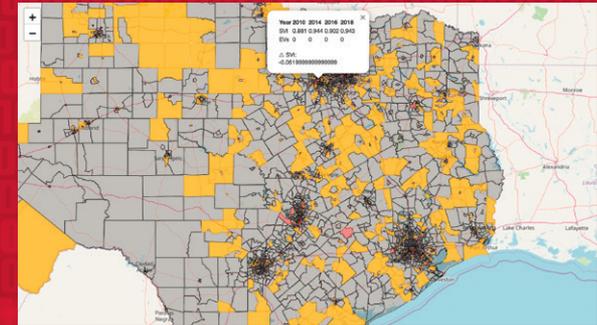
TEAM

Samuel DeZube

Dr. Özgür M. Araz, Professor of Supply Chain Management and Analytics, UNL

Dr. Tammy Beck, Associate Professor of Management and Interim Director School of Accountancy, UNL

Dr. Ibrahim Çapar, Assistant Professor, Applied Statistics and Operations Research, BGSU



Interactive map combining geospatial EVCS and social vulnerability data over time.



Electric vehicle chargers.

An Examination of Gaze Patterns of Novice and Expert Drone Pilots

As drones become more popular, alternatives may be sought in assessing drone pilots for FAA certifications. Currently, the FAA Part 107 drone certification only includes a knowledge exam, not a drone flying proficiency test. We investigate what metrics could be used to assess user proficiency at drone flying.

This research seeks to identify gaze pattern differences between novice and expert drone pilots and how gaze patterns change after a 21-day training program. Our work attempts to identify novel metrics for dynamic stimuli as the pilots watch the drone while flying. Most existing eye-tracking research solely encompasses static stimuli. This project is aimed at creating metrics to assess the proficiency of users based on their gaze patterns during flight. In this study, we use eye-tracking data from novice and expert users and include the relative locations of where the drones were in each task.

We utilized drone detection and tracking with PyTorch to determine the drone location in each frame, as well as the creation of metrics such as fixations and saccades on moving stimuli using the I-VDT algorithm, velocity and dispersion threshold identification. This research is a novel application of eye-tracking data analysis.

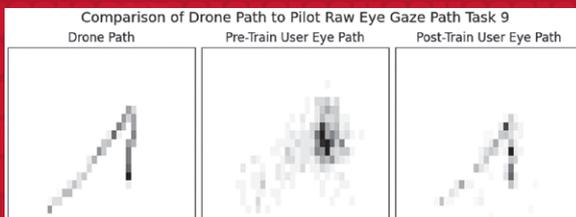
These metrics demonstrate an ability to assess awareness within a situation containing dynamic stimuli. Future assessments of drone pilots may use these metrics to assess proficiency. If pilots are certified with no applicable flying experience, we may be putting bystanders at risk of injuries due to loss of control or other malfunctions during flight. Future work could enable the FAA and other governing bodies to ensure a user's skill level before certifying them. By understanding novice and expert users' eye patterns, we can also guide beginner users during training on what they should focus on for better performance.



Participants conduct control test using monitor and Futaba controller to simulate drone movements.



Pilot flies drone from an exocentric viewpoint.



User eye gaze data in comparison to drone path before and after 20-days of training.

TEAM

Angeline Luther

Dr. Brittany Duncan, Associate Professor, UNL School of Computing

Dr. Siya Kunde, Research Staff Member, IBM

Dr. Bonita Sharif, Associate Professor, UNL School of Computing

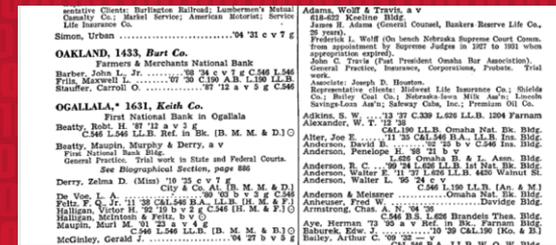
Hidden Histories: Nebraska Women in Law from 1868 to 1950

Who are the women who first practiced law in Nebraska? Why are these women so difficult to identify? Can we recognize shared characteristics or trends? Data collection spanned the years of 1868 to 1950, taking information from the Martindale-Hubbell Legal directories, census records, graduation lists, and digitized newspapers to produce a dataset of information on 109 women lawyers. The database contains demographic data, educational information, and opinions on what the local legal community thought of these women's legal abilities. Combining this information into one place serves as a dataset that is the first of its kind, a call to action for legal data collection moving forward.

Because the data is unreliable, difficult to find, and time consuming to validate, these women become exceptional. Their stories are placed on a pedestal as a monumental ideal, a testament to the achievements of other women like them. When the emphasis is placed upon the "first" women, the struggles and achievements of every subsequent woman that follows remains obscured, perpetuating the notion that women in law are an exception to the rule. This effort required months of data collection, ultimately creating space for people outside of the majority to find themselves in the field of law, dismantling the expectations of perfection or exceptionalism placed upon women in law.

TEAM

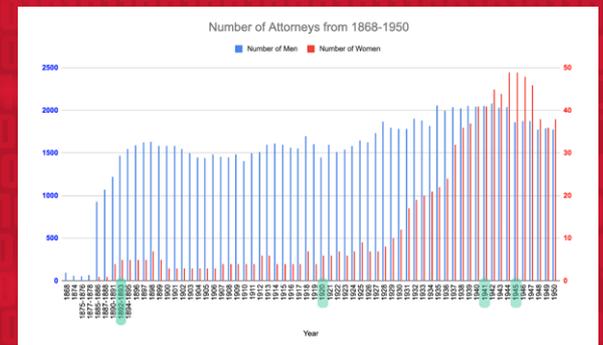
- Clare Kramper
- Dr. Steve Cooper, Executive Director of the Raikes School
- Dr. Katrina Jagodinsky, Susan J. Rosowski Associate Professor of History



One page of the 1940 Martindale-Hubbell Legal Directory, listing both Zelma Derry (Ogallala) and Penelope Anderson (Omaha).



Screenshot of the Airtable database, with Zelma Derry's information highlighted, translating the Martindale-Hubbell information into data.



Total number of male and female lawyers collected from Martindale-Hubbell each year. Important highlighted years: first UNL female law graduate, 19th amendment, and U.S. involvement in WWII.

AT A GLANCE



STUDENTS' MAJORS

| | | | |
|------------------------|----|------------------------|----|
| Actuarial Science | 10 | History | 1 |
| Business Management | 2 | Marketing | 2 |
| Computer Engineering | 1 | Mathematics | 2 |
| Computer Science | 61 | Mechanical Engineering | 3 |
| Electrical Engineering | 3 | Software Engineering | 16 |
| Finance | 3 | | |

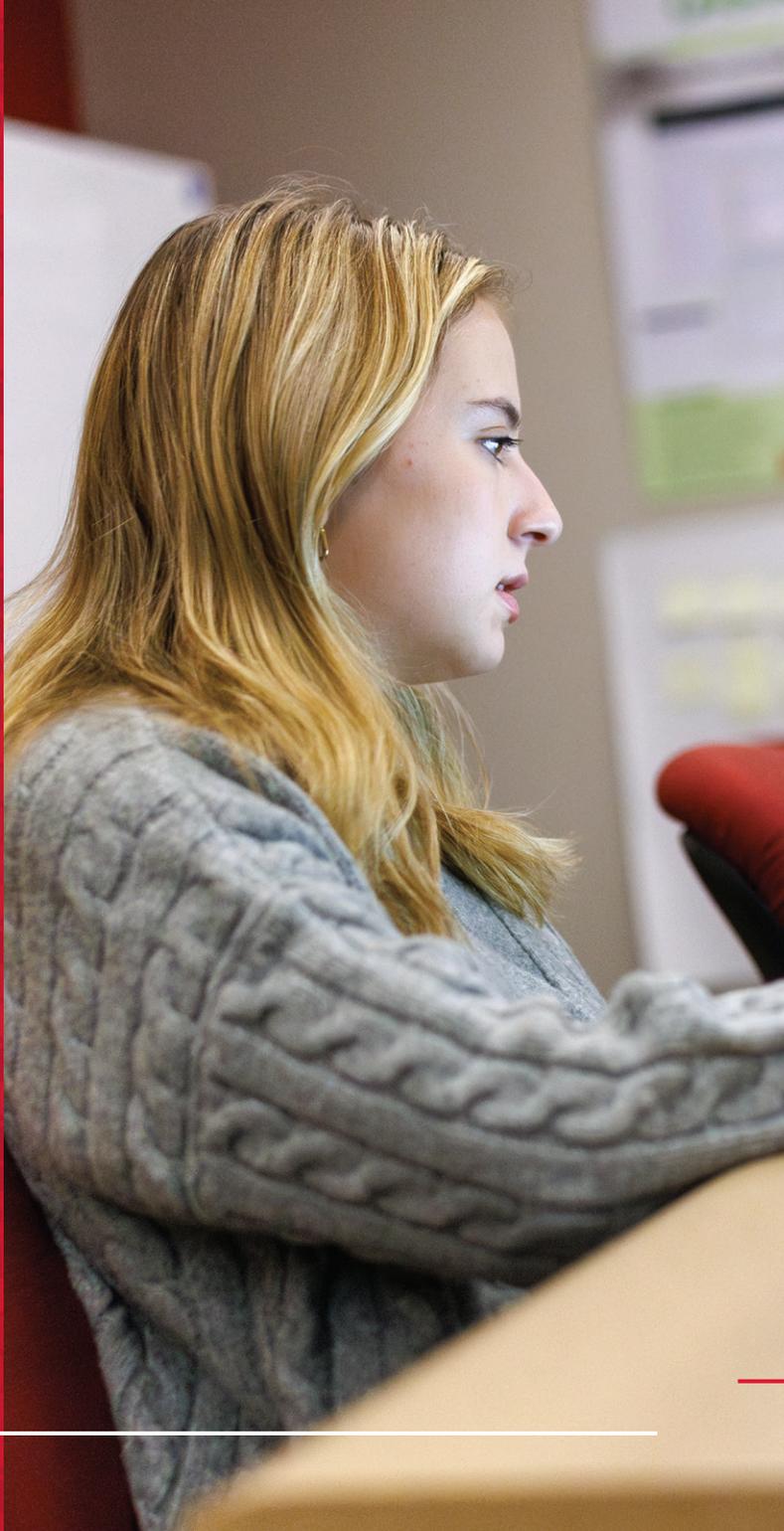


INDUSTRIES REPRESENTED

| | |
|-----------------|--------------------|
| Agriculture | Healthcare/Medical |
| Construction | Insurance |
| E-commerce | Nonprofit |
| Engineering | Public Interest |
| Fiber Broadband | Transportation |
| Finance/Banking | Retail |
| Government | |

PRIMARY BUSINESS VALUE

| | | Efficiency | Growth | Customer Satisfaction | Agility | Ground Breaking |
|--------------------------|-----------------------|--|----------|------------------------------------|---------|-----------------------------------|
| PRIMARY TECHNICAL DOMAIN | Business Analytics | > Allstate | > Allo | > FNBO | | |
| | Digital Operations | > INFR > MICAH House (Spreetail Foundation) > Scoular | | | | |
| | User Experience | > City of Lincoln > Mutual of Omaha | | > NSAA | | > Hudl > Nelnet |
| | Integrated Systems | > Kiewit > Signature Performance | | | | > Cattle Kettle > Olsson |
| | Emerging Technologies | | > Buckle | > Dyslexico > Medical Solutions | > DMSi | > Farm Credit Services of America |



WHY Sponsor a Project?

In addition to growing the business and technology workforce in Nebraska, our sponsors bring value back to their companies through:

› THE OUTPUT OF THE PROJECT:

- Cost savings
- Efficiency improvements
- Proofs-of-concept
- Acquired intellectual property

› INNOVATIVE WAYS OF THINKING:

- Students bring experience with emerging technologies
- Think outside the realm of how your industry or organization “has always done it”

› IDEAL SETTING FOR EXPERIMENTATION:

- Good fit for new and emerging managers to lead
- Low-risk way to try creative solutions

WHEN are Projects Selected?

APRIL/MAY

Many of our partners are so passionate about the program, they come back year after year. As soon as showcase concludes, we will start finalizing projects for the next year and identify opportunities for new sponsors. Spring is the perfect time to reach out to Design Studio staff to inquire about a project.

JUNE/JULY

This is when projects are confirmed and selected sponsors finalize their statements of work.

AUGUST

Sponsors and coaches gather for a summit, and projects are each assigned a student product manager and a development manager. Once the fall semester begins, sponsors participate in project rollout, a career-fair style event where students learn about the projects to discern the best fit for them personally.



The Design Studio Team



► **ROB NICKOLAUS**
Director of Design Studio

Rob has been involved in software and technology teams for thirty years working with startups, large companies, nonprofits, and volunteer organizations. Rob's passion is being a part of the growth in the next generation of Nebraska leaders.



► **RACHEL MICHAELA BRADLEY**
Design Studio Architecture and Engineering Lead

A budding academic with over a decade of experience in software and IT, Rachel uses her expertise to guide students through the technical challenges they face in Design Studio.



► **NANCY HEYNE**
Design Studio Program Lead

With over twenty years of business experience in public relations and marketing communications, Nancy works with our industry partners to identify projects and coaches teams year-round.



► **DR. STEVE COOPER**
Executive Director of the Raikes School

Previously at Stanford University, Steve believes in learning by doing and that changing the world in the 21st century starts with understanding business and computer science.



► **JAKE KOPERSKI**
Design Studio Program Lead

Previously a software engineer and startup entrepreneur, Jake is now creating opportunities for student entrepreneurs and mentoring teams on best practices.



► **DR. JUSTIN FIRESTONE**
Assistant Professor of Practice,
Academic Lead

Focused on the intersection of technology, ethics, and law, Justin teaches software engineering and business law courses for the Raikes School and cyber law at Nebraska Law.



➤ **DR. ROBERT MACKALSKI**
Assistant Professor of Practice,
Academic Lead

Software entrepreneur turned academic, Bob teaches marketing courses at the Raikes School.



➤ **DR. SETH POLSLEY**
Assistant Professor of Practice,
Academic Lead

As a data science professor at the Raikes School, Seth promotes the integration of artificial intelligence into practical applications.



➤ **DR. STEPHANIE VALENTINE**
Associate Professor of Practice,
Academic Lead

Teaching software engineering courses at the Raikes School, Stephanie works with Design Studio teams on novel interaction design and applied machine learning.



SPECIAL THANKS

Startup Studio Advisors

Startup Studio advisors act as executive sponsors for the teams. They participate in release meetings and provide feedback.

Team Dyslexico: Mike Cassling, CQuence Health Group

Team INFR: Pat Kerrigan, The Palm Beach Holding Company, Ltd.

Team Cattle Kettle: Josh DeMers, The Combine



Entrepreneur Panel

Along with the advisors, these volunteers attended release meetings throughout the year to provide feedback and guidance to the teams.

- Ashlea Allberry
- Scott Baird
- Bart Dillashaw
- Cheryl Nelson
- Erica Wassinger

Design Studio Coaches

Coaches are industry experts and volunteers who meet with the team weekly and provide mentorship and guidance on best practices.

- Bill Anderson
- Paul Cooper
- Rees Klintworth
- John Roby
- Leon Stewart
- Rod Beery
- Nick Ebert
- Marek Kracl
- Jacob Sanchez
- Sherry Weber
- Todd Bryant
- Andy Giese
- Santi Murtagh
- Ashlyn Slawnyk
- Matt Will
- Sean Carroll
- Nick Hershberger
- Brendan Owens
- Trevor Slawnyk
- Brian Zimmer

Guest Speakers

- Philip Abraham
- Arthur Doler
- Eric Reichwaldt
- Andrew Sherwood
- Bill Anderson
- Julia Hogeland
- John Roby
- Matt Zwiebel
- Andy Bayer
- Ray Panfil
- Kristi Russell

Special Thanks

- Becky Barnard
- Julie Perez
- Lauren Becwar
- Stephanie Severin
- Ashley Harris
- Kylie Turner
- Kelvin Kemp
- Stephanie Watson
- Dr. Mark Lukin
- Ben Williamson
- Brooke Pauley



DMSi staff with their Design Studio team during an on-site meeting in Omaha.

JOIN US IN CREATING »» WORLD-CLASS INNOVATORS!

- To learn more about supporting the Jeffrey S. Raikes School of Computer Science and Management, contact Abby Dieter, Director of Development
abby.dieter@nufoundation.org | 800-432-3216
- To learn more about sponsoring a project, volunteering, or joining Design Studio as a student, contact Rob Nickolaus, Director of Design Studio
designstudio@unl.edu

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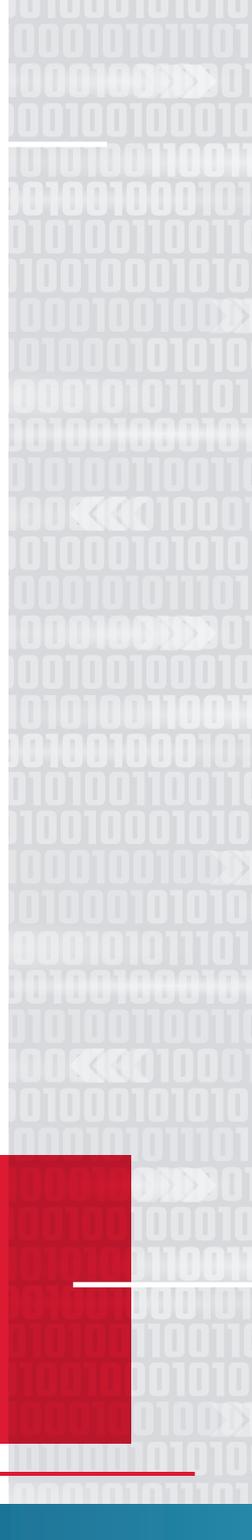


“

**Grow impactful
leaders using
innovation...
this is what our
program is built
to do best.**

”

— Rob Nickolaus, Director of Design Studio —



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