James Wade

AI DEVELOPER TOOLS · ENTERPRISE R&D

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3,000	84	35	3×
SCIENTISTS	SHINY APPS	PACKAGES	POSIT::CONF
AI strategy lead	50 R + 34 Python	25 R + 10 Python	speaker

ABOUT

I build AI-powered developer tools on Posit's stack and ship them at enterprise scale — 35 packages, 84 Shiny apps, and direct collaboration with Posit engineers. At Dow, I lead AI strategy for a 3,000-person R&D organization while navigating the same disruption reshaping how all software gets built. I've been building for what comes next.

OPEN SOURCE

shinymcp

CREATOR

Bridges Shiny apps and AI agents via the Model Context Protocol. Auto-detects inputs, tracks the reactive graph, and routes tools — so any Shiny app becomes an MCP server.

deputy

CREATOR

Agentic AI workflows for R. Multi-agent delegation, tool policies, pre/post hooks, structured output, and streaming with a terminal CLI.

measure

CREATOR

Tidymodels-native package for measurement science — brings psychometric and analytical measurement models into the tidymodels framework with a consistent, composable API.

measure.sec

CREATOR

Size exclusion chromatography tools built on tidymodels. Calibration, molecular weight distribution analysis, and integration with the measure ecosystem.

dsprrr

CREATOR

R port of Stanford NLP's DSPy framework — declarative, self-improving language programs. Prompt optimization, module composition, and cost tracking. Officially listed by Stanford.

gptstudio

800+ stars

CREATOR & MAINTAINER

Early-mover RStudio IDE addin integrating LLMs into the coding workflow. Multi-provider support, published to CRAN. Paved the way for Posit's native AI tooling.

Also contributed to: **ellmer**, **py-shiny**, **shinychat**, **tidyr**, **dplyr**, **parsnip**, **embed**, **rsample**, **Stanford DSPy**, **Axolotl**, **Mistral.AI**

SKILLS

POSIT ECOSYSTEM

Shiny (R & Python) · RStudio IDE Extensions · bslib · shinychat · Quarto · Connect · Workbench · Package Manager

AI & LLMS

Agentic Systems · MCP Protocol · RAG · DSPy / Prompt Optimization · Multi-Provider APIs · Claude Agent SDK · Vector Databases · Fine-Tuning

SOFTWARE ENGINEERING

R · Python · TypeScript · Package Development (CRAN) · Git/GitHub · CI/CD · Docker · DuckDB/Arrow

DATA SCIENCE & ENTERPRISE

Tidyverse · Tidymodels · MLOps · Statistical Modeling · Platform Administration

EXPERIENCE

Research Scientist

2022 – Present

Dow · Midland, MI

- Lead AI strategy for Dow's 3,000-person R&D organization and directly advise the CTSO on AI and digitalization priorities.
- Co-developed chat UI components and AI tooling directly with Posit engineers Joe Cheng, Garrick Aden-Buie, and Carson Sievert. Contributed to ellmer, py-shiny, shinychat, and core tidyverse packages.
- Architected an AI-powered emissions monitoring platform serving 27 manufacturing sites across 6 countries, with an LLM pipeline that auto-converts Excel workbooks into production Python code.
- Co-developed an LLM-powered Patent Analysis tool highlighted to Dow's Board of Directors and Microsoft's leadership team.
- Scaled generative AI from proof-of-concept to enterprise-wide deployment, expanding secure access to frontier and open models across the organization.
- Built and deployed 84 Shiny applications (50 R, 34 Python) to Posit Connect — including ML model APIs, live data pipelines, and 19 AI-powered production apps.
- Authored 35 packages (25 R, 10 Python), establishing package development patterns and CI/CD workflows adopted organization-wide.
- Created shinymcp, deputy, dsprrr, and gptstudio — open source AI developer tools spanning MCP protocol, agentic workflows, prompt optimization, and IDE integration.

Associate Research Scientist
2020 – 2022

Dow · Midland, MI

- Founded and led the data science strategy team for Analytical Science, defining best practices for R, Python, and AI enablement across a 400-person organization.
- Designed and delivered the Citizen Data Science curriculum and led Posit Academy mentorship, achieving >90% training completion and mentoring 25+ professionals across multiple organizations.
- Key contributor to Dow's enterprise AI Strategy, defining the organizational operating model and leading the Scale & Standards sub-team.
- Led an AI-enabled plastic recycling project, building ML models that maintained product performance with increased recycled content — recognized with two internal awards.

Senior Chemist
2018 – 2020

Dow · Midland, MI

- Pioneered a deep learning approach to modeling product performance in manufacturing, resulting in a patent submission and $2.3MM+ in realized value.
- Built a Shiny-based Duty Drawback tool enabling $2.5MM one-time and $1.2MM annual savings for the supply chain organization.

Postdoctoral Fellow
2017

University of Michigan · Ann Arbor, MI

- Biosensor and microfluidic research, supporting lab transition from UIUC to the University of Michigan.

Graduate Research Fellow
2012 – 2017

University of Illinois at Urbana-Champaign · Urbana, IL

- Developed biosensors and microfluidic tools for precision medicine, including multiplex diagnostic panels on silicon photonic microring resonator arrays.
- Integrated microring resonators with separation technologies for applications in industrial polymer analysis.
- Mentored 4 undergraduate and 3 graduate students; contributed to successful NSF and NIH proposals.

Undergraduate Research Fellow
2008 – 2012

Furman University · Greenville, SC

- Published 2 research papers, delivered 14 presentations, and mentored 5 undergraduate students.

EDUCATION

Doctor of Philosophy in Chemistry
2012 – 2017

University of Illinois at Urbana-Champaign · Urbana, IL

Bachelor of Science in Chemistry
2008 – 2012

Furman University · Greenville, SC

AWARDS & RECOGNITION

2021 Technical Achievement Award (Project Lead)
Dow

2021 Manufacturing Innovation Award (Project Lead)
Dow

2019 Data Science Innovation Challenge Winner (1 of 3 selected — Project Lead)
Dow

2016 ACS Division of Analytical Chemistry Graduate Fellowship
University of Illinois

2012 – 2015 NSF Graduate Research Fellow
University of Illinois

PUBLICATIONS

10 peer-reviewed publications listed below, plus 40 internal publications, 29 internal technical reports, and 8 internal filings for intellectual property disclosure.

1. **The Citizen Data Science program at Dow**
   Andrews K, Arturo S, Benedict M, Braun B, Clark B, Cook S, Curtis-Fisk J, D'Ottaviano F, Licquia T, Margl P, Moore J, Naler L, Singh P, Schmidt A, Sokolov A, Talbert J, **Wade JH**. *Digital Discovery*, 2025.

2. **A linear mass concentration detector for solvent gradient polymer separations**
   Mordan EH, **Wade JH**, Pearce E, Meunier DM, Bailey RC. *Analyst*, 2020.
3. **Recent advances in separation-based techniques for synthetic polymer characterization**
   Meunier DM, **Wade JH**, Janco M, Cong R, Gao W, Li Y, Mekap D, Wang G. *Analytical Chemistry*, 2020.
4. **Silicon Photonic Microring Resonator Arrays for Mass Concentration Detection of Polymers in Isocratic Separations**
   Mordan EH, **Wade JH**, Wiersma ZSB, Pearce E, Pangburn TO, deGroot AW, Meunier DM, Bailey RC. *Analytical Chemistry*, 2018.
5. **Microfluidic platform for efficient Nanodisc assembly, membrane protein incorporation, and purification**
   Wade JH, Jones JD, Lenov IL, Riordan CM, Sligar SG, Bailey RC. *Lab on a Chip*, 2017.
6. **Applications of optical microcavity resonators in analytical chemistry**
   Wade JH, Bailey RC. *Annual Review of Analytical Chemistry*, 2016.
7. **Rapid, multiplexed phosphoprotein profiling using silicon photonic sensor arrays**
   Wade JH, Alsop AT, Vertin NR, Yang H, Johnson MD, Bailey RC. *ACS Central Science*, 2015.
8. **Refractive index-based detection of gradient elution liquid chromatography using chip-integrated microring resonator arrays**
   Wade JH, Bailey RC. *Analytical Chemistry*, 2014.
9. **A unified mechanism for abiotic adenine and purine synthesis in formamide**
   Hudson JS, Eberle JF, Vachhani RH, Rogers LC, **Wade JH**, Krishnamurthy R, Springsteen G. *Angewandte Chemie*, 2012.
10. **Synthesis of cis and trans Bis-alkynyl Complexes of Cr(III) and Rh(III) Supported by a Tetradentate Macrocyclic Amine: A Spectroscopic Investigation of the M(III)–Alkynyl Interaction**
    Sun C, Turlington CR, Thomas WW, **Wade JH**, Stout WM, Grisenti DL, Forrest WP, VanDerveer DG, Wagenknecht PS. *Inorganic Chemistry*, 2011.