Brian Hempel

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Current

I am a postdoc working on a GUI+code interface for plotting in Haijun Xia's Creativity Lab at UCSD. This is a stepping stone towards the long-term vision of elevating value-centric interactions up to the operating system level, transforming the OS into a universal end-user programming interface.

For summer/fall 2022 I was a postdoc at the Cooperative Institute for Severe and High-Impact Weather Research and Operations (CIWRO) and the Storm Prediction Center (SPC) to improve and operationalize my Nadocast machine learning severe weather outlook generator. Its guidance is now in use by the human forecasters at the SPC.

Prior to that I finished my Ph.D. in March 2022 at the University of Chicago, advised by Ravi Chugh. I focused on improving programming by adding direct manipulation interactions *in addition to* ordinary textual editing, in contrast to most prior approaches that sacrificed ordinary code editing when adding direct manipulation interactions.

Archival Publications

B. Hempel and R. Chugh. Maniposynth: Bimodal Tangible Functional Programming. *European Conference on Object-Oriented Programming (ECOOP 2022)*.

B. Hempel and R. Chugh. Tiny Structure Editors for Low, Low Prices! (Generating GUIs from toString Functions) *IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC 2020)*. (Short paper.)

B. Hempel, J. Lubin, and R. Chugh. Sketch-n-Sketch: Output-Directed Programming for SVG. *ACM Symposium on User Interface Software and Technology (UIST 2019)*. (Honorable Mention for Best Demo.)

B. Hempel, J. Lubin, G. Lu, and R. Chugh. Deuce: A Lightweight User Interface for Structured Editing. *40th International Conference on Software Engineering (ICSE 2018)*.

B. Hempel and R. Chugh. Semi-Automated SVG Programming via Direct Manipulation. *ACM Symposium on User Interface Software and Technology (UIST 2016)*.

R. Chugh, B. Hempel, M. Spradlin, and J. Albers. Programmatic and Direct Manipulation, Together at Last. *ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI 2016)*.

Dissertation

B. Hempel. [Tangible Values with Text: Explorations of Bimodal Programming.](#) Ph.D. Dissertation. March 2022.

Academic Service

Organizing Committee	LIVE 2021, LIVE 2020
Program Committee	Convivial Computing Salon 2020, LIVE 2018
Artifact Evaluation Committee	PLDI 2019, PLDI 2018
Reviewer	UIST 2023, TOCHI 2023, PLATEAU 2023, CHI 2023, UIST 2022, UIST 2021, UIST 2020, CHI 2020, UIST 2018

Teaching

Instructor	Honors Intro to Programming, I University of Chicago CMSC 16100 Mean instructor rating: 4.7/5.0 Mean course rating: 4.6/5.0 *"Brian really cares about the subject, so he spent a lot of time making sure the lectures make sense. He's a great instructor!" - Anon. Student*	Fall Qrtr 2019
Lab TA	Honors Intro to Programming, I University of Chicago CMSC 16100	Fall Qrtrs 2016-2018, 2020, 2021
TA	Intro to Creative Coding University of Chicago CMSC 19911	July 2021
TA	Art with Science: Creative Coding University of Chicago CSP 2021	July 2021
Math Instructor	Mathnasium, Stevensville, MI	2013 – 2015

Software Artifacts

[Maniposynth](#)	*Non-linear* graphical editing with *linear* code.
[Sketch-n-Sketch](#)	Direct manipulation on *output*.
[Deuce](#)	Direct manipulation on *code*.
[Nadocast.com](#)	Tornado prediction via ML post-processing of public weather models. Operational since June 2022 at the National Weather Service Storm Prediction Center as internal experimental guidance.

Education

2022. Ph.D. in Computer Science, University of Chicago.
Dissertation: Tangible Values with Text: Explorations of Bimodal Programming.

2019. M.S. in the Computer Science Ph.D. Program, University of Chicago.
M.S. Paper: Output-Directed SVG Programming.

2009. B.S. in Bioinformatics and Biochemistry/Molecular Biology, Michigan Technological University.

Supplementary Education

2012 – 2013. Diploma, Augustine College (Ottawa). 8-month full-time program on Western Culture.

Industry Experience

Developer	Collective Idea	Holland, MI	2012, 2014 – 2015
Web Developer	IHS Web Design	Holland, MI	2010 – 2012