Bogdan Pikula

Toronto, ON — pikula@cs.toronto.edu — +1 (416) 834-9406 — LinkedIn — Open Work Permit

EDUCATION

University of Toronto, Toronto, ON, Canada — Jan 2024 — Present
PhD, Computer Science

- **Supervisor:** Dr. Daniel Wigdor
- **Research Areas:** Large Language Models, HCI, Human-AI interaction, GenUI, Facial Animation
- **Relevant Coursework:** Reinforcement Learning, Imitation Learning for Robotics, 3D Facial Modeling and Animation, Human-Centered Computing, User Interfaces.

University of Toronto, Toronto, ON, Canada — Sep 2022 — Dec 2023
Master of Science, MSc, Computer Science

- **Supervisors:** Dr. Daniel Wigdor, Dr. Steve Engels
- **Research Areas:** Facial Animation, Affective Computing, Generative Models.

Taras Shevchenko National University of Kyiv, Ukraine — Sep 2017 — Jun 2021
Bachelor of System Analysis, with Honors, Computer Science — Overall GPA: 93.5 / 100

- **Relevant Coursework:** Advanced Calculus, Discrete Math, Linear Algebra, Probability, Statistics, Game Theory, System Modeling and Optimization, Machine Learning

Teaching Assistant Positions and Responsibilities

Course	Responsibilities
CSC236: Intro to the Theory of Computation	Prepped study material and held interactive weekly tutorials, discussions, office hours; Assignment and Exam Grading;
CSC263: Data Structure and Analysis	
CSC194: Impactful Video Game Design	Mentored CS, Social-Science, Art and Music students, developing video games[1],[2] in interdisciplinary teams that get presented at LevelUp Showcase. Organized tutorials and feedback events.
CSC404: Video Game Design	
CSC2558: Topics in Multidisciplinary HCI	Held research seminars with guest speakers on various HCI topics, organized reflection-sessions, gave feedback on student's final projects.

EXPERIENCE

Dynamic Graphics Project (DGP) — Toronto, ON, Canada
Research Assistant — Sep 2023 – Present

- Deployed and locally fine-tuned Image-Text-to-Text and Visual Question Answering (VQA) models, scaling them to handle interactive, user-centric tasks at real-time speeds. Integrated them into user interface demos.
- Developed a human-AI collaborative system that uses LLMs to assist novice photographers in framing and enhancing image composition [preview]

La Forge, Ubisoft — Toronto, ON, Canada
Research and Development Intern — Jan 2023 - March 2023

- Created a dataset of facial representations for different emotions and developed an approach for modeling realistic static facial expressions.
- Helped implement seamless facial expression transition animation generation, tailoring them to different emotional contexts.
- Collaborated on the development of an internal universal tool for visualizing facial expressions in Maya from muscle-skeleton facial representation.
- Worked on a dynamic way to generate responsive facial reactions in gaming environments for more immersive character interactions.

University of Toronto & Bank of Canada Digital Analytic Zone — Toronto, ON, Canada
Research Assistant — Sep 2022 – Aug 2023

- Worked with Prof. Michelle Alexopoulos on identifying emotional cues from video and audio sources.
- Created a pipeline for extracting facial expressions, pose estimations, face and hand gestures from hundreds of hours of video data scaling parallelized compute on GPU clusters. Performed inference optimization.

University of Toronto, Department of Computer Science — Toronto, ON, Canada
Student Summer Researcher — May 2022 – Aug 2022

- Worked with Prof. Steve Engels (DCS) and Ana Zdravkovic (OISE) on creating a system for determining negative emotions in kids while using educational video games for studying math.
- Created a tool for detecting shifts from the state of emotional neutrality to positivity/negativity based on facial attribute deviations, using the FACS coding system as the backbone.

Sierentz Global Merchants — Kyiv, Ukraine
Data Scientist — Sep 2021 – Aug 2022

- Lead a 3-person team tasked with automating data collection from public and private sources.
- Automated acquisition, processing, and storing data on a PostgreSQL DB using AWS.

- Analyzed the data and built statistical models for supply / demand forecasting, as well as other agricultural indicators.
- Developed the back-end for a webtool used by Ags traders at Sierentz North America that improved access to historical and new data, its accuracy, and auditability.
- Improved the process of calculating the logistics of connecting grain silos with major Ukrainian seaports by means of transport by rail network or by means of boats or trucks.

PUBLICATIONS

Pikula, B., & Engels, S. (2023, Oct.). Flexcomb: A facial landmark-based model for expression combination generation. *Proceedings of the AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment*, *19*(1), 337-342. Retrieved from https://ojs.aaai.org/index.php/AIIDE/article/view/27529 doi: 10.1609/aiide.v19i1.27529 [poster] [paper]

Pikula, B. (2021). Development of the method for solving antagonistic games with a type-2 fuzzy matrix. *Information society: technological, economic and technical aspects of formation (issue 59)*.

PROJECTS

Real-Time Streaming Audio Lip-Syncing Toronto, ON, Canada
CSC2521: Topics in CG: 3D Facial Modeling and Animation - [report] Jan 2024

Tea Time Los Angeles, CA
From Computer Graphics' Past to the Future - [project] Aug 2023

- Tea Time is an interactive exhibit that displays historical SIGGRAPH content on a monitor and is controlled via natural gestures with a teapot
- Contributed by creating code for extracting acceleration data from a M5StickC Plus. Implemented gesture recognition on a Raspberry Pi 4 model B.

Toronto Health Datathon 2023 Toronto, ON
Uplifting GIM Diagnostics [datathon] [presentation] Feb 2023

- The solution aimed to simplify the diagnostic workflow by reducing the number of assessments performed on the general internal medicine ward.
- We used past known lab test results to predict whether the patient deteriorated or was discharged.
- As a result, we could decrease the number of additional tests by an average of 3% while retaining the same result.

Research on Antagonistic Games with Type-2 Fuzzy Matrices Kyiv, Ukraine
Bachelor's Thesis [extended abstract] Jun 2021

- Published my findings at an International Scientific Internet Conference on "Information Society: Technological, Economic, and Technical Aspects of Formation." (ISSN 2522-932X)

AWARDS

- **Academic Excellence Scholarship** Top of the class, $1000/year Sep 2018 — Jun 2021
- **University of Toronto Graduate Research Fellowship** $58,000/year Sep 2022 — Jun 2024
- **SSHRC Graduate Research Grant** $20,000/year Sep 2022 — Aug 2023

SKILLS

- **Languages** Python, C, CUDA, C++, SQL, js
- **Machine Learning** Deep Learning, Computer Vision, Time Series, Feature Engineering, Facial Attribute Generation, Visualization, UI Understanding, Prompt Engineering.
- **Frameworks** PyTorch, TensorFlow, PyG, transformers, NumPy, Pandas, Sklearn, LightGBM, Matplotlib, JAX, ReactJS.
- **Tools** Git, Databricks, WandB, Linux, Bash, LaTex, AWS, cuDNN, Gradio, Heroku.
- **Databases** PostgreSQL, MongoDB, MySQL.

LEADERSHIP AND INVOLVEMENT

DGP Academy. March 2024
A week-long outreach event hosted by DGP for high schoolers to get a glimpse of what research is like. Held a 3-day workshop on mesh simplification and computational fabrication [dgp-academy]

CSGSBS. The president and social coordinator of the union Sep 2022 — Present
Helped organize events, delegated council meetings, and addressed students' concerns. Helped to establish a union office / lounge for graduate students. [csgsbs]

UofT summer research program for Ukrainians. Feb 2023 — Apr 2023
Interviewed candidates as an admission board member for the University of Toronto Summer Program for Students from Ukraine. The process included reviewing resumes and motivation letters, as well as conducting interviews to assess experience, technical strength, and research potential.[program]