Krzysztof Pietroszek

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I am an Assistant Professor in the School of Computing and Design, California State University Monterey Bay. I also am a writer/director/producer/game designer with my own film/game studio. These two lives are linked through my interest in gaming, virtual reality, and interactive cinema.

Education

- **Ph.D. in Compute Science (Human Computer Interaction)** — Waterloo, Canada
  Cheriton School of Computer Science, University of Waterloo — *Aug. 2015*
- **M.F.A. in Film** — Toronto, Canada
  School of Fine Arts, York University — *Apr. 2011*
- **M.A. in Communication Studies (Ethnographic Film)** — Toronto, Canada
  Department of Communication Studies, Wilfrid Laurier University — *Feb. 2010*
- **B.Sc./M.Sc. in Computer Science, minor in Archaeology** — Wroclaw, Poland
  Institute of Computer Science, Faculty of Mathematics, University of Wroclaw — *Apr. 2004*

Work Experience

- **Assistant Professor (tenure-track) & Director of Game Research Lab** — Seaside, CA
  School of Computing and Design, California State University Monterey Bay — *Aug. 2015 – present*
- **Adjunct Research Professor** — Seaside, CA
  School of Computing and Design, California State University Monterey Bay — *Feb. 2015 – Jul. 2015*
- **KPicture Productions Inc, Founder and Owner** — Toronto, Canada
  Games, Films and New Media production company (www.kpicture.com) — *2008 - Present*
  - **Games**: Banzai Ball (movie theatre game), Earth Defender (mobile game), Little Red Riding Hood (interactive storybook for movie theatres).
  - **Films**: Waiting for Summer (award-winning feature film), Greenscreen, Daniel, Agape (short films), Apptui, MixMasher (mobile apps)
- **Newground Films Inc, Feature Film Producer** — Toronto, Canada
  Single-purpose film production corporation — *2014 – 2016*
  - **Waiting for Summer**: Award-winning theatrically-distributed Canadian drama by first time director, Senthil Vinu
- **CineClick Inc., Founder and CEO** — Waterloo, Canada
  Invented and led product development for CineClick, a mass gaming system for movie theatres. — *2013 – 2014*
- **NetClick Inc., Co-founder and CEO** — Waterloo, Canada
  Invented, and led product development of a real-time mobile student response system. — *2006 – 2008*
- **Wilfrid Laurier University, Director of Language Learning Centre** — Waterloo, Canada
  Managed a language learning centre that served over 1000 students. — *2012 – 2014*
- **Christie Digital Systems, NSERC/MITACS Research Intern** — Waterloo, Canada
  Designed proprietary, immersive telepresence system, preserving eye contact of the interlocutors. — *2010*
- **Nokia Siemens Networks, Junior Software Engineer** — Berlin, Germany
  I served as a Java developer responsible for charging module of "Advantage" prepaid mobile platform. — *2003 – 2004*
- **Opticomp, Owner** — Toronto, Canada
  Game and new media startup — *1994-1999*
  - **Castles Game**: As a 14-year-old, I wrote my first video game, Dune-like RTS, and self-distributed it.
  - **Cieszyn, a city guide**: A multimedia application I designed and programmed, which included a simple puzzle game, and was distributed in bookstores across the region.

Research Publications

My research interests include equitable access to Virtual and Augmented Reality, 3D Interactions for VR and AR (especially using mobile and wearable devices), and applications of VR/AR technologies in entertainment and serious games, education, medicine, wellbeing, and assistive technologies. I publish mainly in ACM and IEEE associations in the areas of Human-Computer Interaction, Computer Graphics, and Game Design research communities, with occasional publications on Educational Technology. According to Google Scholar, my current citation count is 418 and my h-index is 7.

Refereed Publications (journal papers, proceedings posters and papers)

[1] Christian Eckhardt, John Sullivan, and **Krzysztof Pietroszek**. Hand gesture recognition using arm-mounted flex sensors. In *Proceedings of the 2017 Symposium on Spatial User Interaction*. ACM, 2017.

[2] **Krzysztof Pietroszek**, Phuc Pham, Sophia Rose, Liudmila Tahai, Irene Humer, and Christian Eckhardt. Real-time avatar animation synthesis from coarse motion input. In *Proceedings of the 23nd ACM Conference on Virtual Reality Software and Technology*. ACM, 2017.

[3] **Krzysztof Pietroszek**, Pham Phuc, and Christian Eckhardt. Cs-dtw: Real-time matching of multivariate spatial input against thousands of templates using compute shader dtw. In *Proceedings of the 2017 Symposium on Spatial User Interaction*. ACM, 2017.

[4] **Krzysztof Pietroszek**, Liudmila Tahai, James R Wallace, and Edward Lank. Watchcasting: Freehand 3d interaction with off-the-shelf smartwatch. In *3D User Interfaces (3DUI), 2017 IEEE Symposium on*, pages 172–175. IEEE, 2017.

[5] Mathew Tomberlin, Liudmila Tahai, and **Krzysztof Pietroszek**. Gauntlet: Travel technique for immersive environments using non-dominant hand. In *Virtual Reality (VR), 2017 IEEE*, pages 299–300. IEEE, 2017.

[6] Jessica Vega, Sophia Rose, Liudmila Tahai, Irene Humer, Christian Eckhardt, and **Krzysztof Pietroszek**. Vr wildfire prevention: Teaching campfire safety in a gamified immersive environment. In *Proceedings of the 22nd ACM Conference on Virtual Reality Software and Technology*, pages 363–364. ACM, 2017.

[7] Matthew Johnson, Irene Humer, Brian Zimmerman, Joshua Shallow, Liudmila Tahai, and **Krzysztof Pietroszek**. Low-cost latency compensation in motion tracking for smartphone-based head mounted display. In *Proceedings of the International Working Conference on Advanced Visual Interfaces*, pages 316–317. ACM, 2016.

[8] Keiko Katsuragawa, **Krzysztof Pietroszek**, James R Wallace, and Edward Lank. Watchpoint: Freehand pointing with a smartwatch in a ubiquitous display environment. In *Proceedings of the International Working Conference on Advanced Visual Interfaces*, pages 128–135. ACM, 2016.

[9] Daniel Kharlamov, **Krzysztof Pietroszek**, and Liudmila Tahai. Ticktockray demo: Smartwatch raycasting for mobile hmds. In *Proceedings of the 2016 Symposium on Spatial User Interaction*, pages 169–169. ACM, 2016.

[10] Daniel Kharlamov, Brandon Woodard, Liudmila Tahai, and **Krzysztof Pietroszek**. Ticktockray: smartwatch-based 3d pointing for smartphone-based virtual reality. In *Proceedings of the 22nd ACM Conference on Virtual Reality Software and Technology*, pages 363–364. ACM, 2016.

[11] **Krzysztof Pietroszek** and Daniel Kharlamov. Ticktockray: Smartwatch raycasting for mobile hmds. In *Proceedings of the 2016 Symposium on Spatial User Interaction*, pages 181–181. ACM, 2016.

[12] Edward R Sykes, Dilip Muthukrishnan, Yousif Al-Yousifi, Darren Spriet, and **Krzysztof Pietroszek**. Mobile devices at the cinema theatre. *Entertainment Computing*, 15:21–39, 2016.

[13] **Krzysztof Pietroszek**, Liudmila Tahai, James R Wallace, and Edward Lank. 3d interaction with networked public displays using mobile and wearable devices. In *Adjunct Proceedings of the 2015 ACM International Joint Conference on Pervasive and Ubiquitous Computing and Proceedings of the 2015 ACM International Symposium on Wearable Computers*, pages 787–788. ACM, 2015.

[14] **Krzysztof Pietroszek**, James R Wallace, and Edward Lank. Tiltcasting: 3d interaction on large displays using a mobile device. In *Proceedings of the 28th Annual ACM Symposium on User Interface Software & Technology*, pages 57–62. ACM, 2015.

[15] **Krzysztof Pietroszek**, Anastasia Kuzminykh, James R Wallace, and Edward Lank. Smartcasting: a discount 3d interaction technique for public displays. In *Proceedings of the 26th Australian Computer-Human Interaction Conference on Designing Futures: the Future of Design*, pages 119–128. ACM, 2014.

[16] Darren Abramson, **Krzysztof Pietroszek**, Leila Chinaei, Edward Lank, and Michael Terry. Classroom response systems in higher education: Meeting user needs with netclick. In *Global Engineering Education Conference (EDUCON), 2013 IEEE*, pages 840–846. IEEE, 2013.

[17] **Krzysztof Pietroszek** and Edward Lank. Clicking blindly: using spatial correspondence to select targets in multi-device environments. In *Proceedings of the 14th international conference on Human-computer interaction with mobile devices and services*, pages 331–334. ACM, 2012.

[18] **Krzysztof Pietroszek**. Providing language instructor with artificial intelligence assistant. *International Journal of Emerging Technologies in Learning*, 2(4), 2007.

[19] Krzysztof Czarnecki and **Krzysztof Pietroszek**. Verifying feature-based model templates against well-formedness ocl constraints. In *Proceedings of the 5th international conference on Generative programming and component engineering*, pages 211–220. ACM, 2006.

[20] Krzysztof Czarnecki, Michal Antkiewicz, Chang Hwan Peter Kim, Sean Lau, and **Krzysztof Pietroszek**. fmp and fmp2rsm: eclipse plug-ins for modeling features using model templates. In *Companion to the 20th annual ACM SIGPLAN conference on Object-oriented programming, systems, languages, and applications*, pages 200–201. ACM, 2005.

[21] Krzysztof Czarnecki, Michal Antkiewicz, Chang Hwan Peter Kim, Sean Lau, and **Krzysztof Pietroszek**. Model-driven software product lines. In *Companion to the 20th annual ACM SIGPLAN conference on Object-oriented programming, systems, languages, and applications*, pages 126–127. ACM, 2005.

[22] Krzysztof Czarnecki, Michal Antkiewicz, CHP Kim, S Lau, and **Krzysztof Pietroszek**. Featureplugin: Feature modeling plug-in for eclipse. In *Michael G. Burke (Herausgeber): Proceedings of the 2004 OOPSLA workshop on Eclipse Technology eXchange (ETX 2004)*, pages 67–72, 2005.

Book Chapters, Theses, Translations

[23] **Krzysztof Pietroszek**. Raycasting in virtual reality. In Newton Lee, editor, *Encyclopedia of Computer Graphics and Games*. Springer, 2018.

[24] **Krzysztof Pietroszek**. Virtual hand metaphor in virtual reality. In Newton Lee, editor, *Encyclopedia of Computer Graphics and Games*. Springer, 2018.

[25] **Krzysztof Pietroszek**. Virtual pointing metaphor in virtual reality. In Newton Lee, editor, *Encyclopedia of Computer Graphics and Games*. Springer, 2018.

[26] **Krzysztof Pietroszek**. *3D Pointing with Everyday Devices: Speed, Occlusion, Fatigue*. PhD thesis, University of Waterloo, 2015.

[27] **Krzysztof Pietroszek**. Agape. Master's thesis, York University, 2011.

[28] **Krzysztof Pietroszek**. Shaman in camera: Shamanism and ethnographic film. Master's thesis, Wilfrid Laurier University, 2010.

[29] **Krzysztof Pietroszek**. Archeodb: Case study of archaeological excavation software design using extreme programming methodology. Master's thesis, University of Wroclaw, 2004.

[30] Jos Warmer and Anneke Kleppe. *The Object Constraint Language: Precise Modeling with UML*. Addison-Wesley, 2003. Translated to Polish by Krzysztof Pietroszek. Wydawnictwa Naukowo-Techniczne, 2003.

Scholarships, Academic Awards & Grant Funding

To date, I have raised over $1,500,000 in scholarships and grants for science, and fine arts projects.

Grants and Other Funding

- **Sally Hughes Church Foundation** — $100,000
  Cash donation for high-end computer equipment for virtual reality lab — *2017*
- **CSUMB UROC Researcher Program** — $80,000
  Funding for four undergraduate research assistants every year for 3 years — *2016*
- **Faceware Technologies Inc. (in-kind donation)** — $60,000
  Ten Faceware Live 2.5, and Faceware Retargeter 2.5 software packages for our research lab — *2016*
- **Voxel Farm Inc. (in-kind donation)** — $30,000
  Online voxel rendering service — *2016*
- **Crytek VR First (in-kind donation)** — $9,000
  Virtual Reality and spatial input hardware and software — *2016*
- **Faculty Incentive Grant** — $10,000
  Grant writing summer funding — *2016*
- **Faculty Startup Funding** — $20,000
  Equipment and conference travel funding — *2015*
- **Summer Research Funding** — $12,000
  Research salary for two summers — *2016*
- **Ontario Centre of Excellence: Co-author, Principal Investigator** — $75,000
  Research and Development Funding for NetClick Inc. — *2014*
- **Imagine K12 (Y-Combinator) investment** — $100,000
  Research and Development funding for NetClick Inc. — *2014*
- **Canada Media Fund: Author and Project Lead** — $500,000
  Research and Development funding for CineClick Interactive Cinema Gaming System — *2013*
- **FedDev JumpStart investment** — $25,000
  Research & Development product commercialization funding provided by federal government — *2013*
- **Velocity: Amazon Startup Credit & Rackspace Startup Credit** — $30,000
  Server and technical support credit — *2013*
- **Bravo!FACT: film production funding** — $40,000
  Funding provided to top ten emerging Canadian filmmakers — *2012*
- **Region of Waterloo Arts Fund** — $10,000
  Film production funding provided by regional arts fund. — *2013*
- **York University "Agape" Film Production Grant** — $1,000
  Film production funding for thesis film — *2010*
- **"Waiting For Summer" feature film (as producer)** — $200,000
  Private investor funding for award-winning theatrically-distributed feature film. — *2009*
- **WLU Investigative Journalism Grant** — $1,500
  Journalism funding provided by The Cord Weekly for investigative journalism projects — *2007*

Scholarships

- **University of Waterloo Graduate Studentship** $19,000
  Annual funding for graduate students maintaining high GPA provided by the Dean's Office *2014-2015*
- **Ontario Graduate Scholarship** $45,000
  Highly-selective state-funded scholarship for graduate students in Canada *2011-2014*
- **University of Waterloo President's Graduate Award** $20,000
  Cash Award for graduate students *2012-2014*
- **Natural Science & Engineering Research Council** $30,000
  Research internship funding for an invention of Glass Telepresence System. *2010*
- **Wilfrid Laurier University Graduate Research Assistantship** $2,000
  Research assistantship funding *2008*
- **University of Waterloo International Masters Student Scholarship** $5,400
  Funding intended to mitigate the costs of international tuition *2005*
- **University of Wroclaw Undergraduate Scholarship** $10,000
  Merit scholarship for maintaining high GPA *2000-2004*

Professional Service

- Reviewer or Program Committee: ICTAI (PC), CHI, UIST, 3DUI, GI, CHI Play, ITS, ISS, TOMM
- Member of Curriculum Committee of CSUMB School of Computing and Design
- Coordinator of Game Development & Game Design Concentration of Computer Science and Communication Design Programs, CSUMB School of Computing and Design
- Member of CSUMB University-wide Student Awards Committee
- Chair of Curriculum and Co-Curriculum Subcommittee, ACE Internationalization Task Force

Research Collaborators

- Naoto Kume (Kyoto University)
- Malgorzata Luszczak (University of Silesia)
- Annette Mosel (Technical University of Vienna)
- Darren Abramson (Dalhousie University)
- Michal Ankiewicz (University of Waterloo)
- Krzysztof Czarnecki (University of Waterloo)
- Adam Fourney (Microsoft Research)
- Sebastian von Mammen (University of Wurzburg)
- Christian Eckardt (CalPoly San Luis Obispo)
- Keiko Katsuragawa (University of Waterloo)
- Chang Huang Peter Kim (Oxford University)
- Jessica Vega (University of Southern California)
- Pawel Synowiec (University of Silesia)
- Glenn Bruns (CSU Monterey Bay)
- Tetiana Koba (Nikolaiv State University)
- Anastesia Kuzminykh (University of Waterloo)
- Irene Humer (CalPoly San Luis Obispo)
- Edward Lank (University of Waterloo)
- Liudmila Tahai (University of Waterloo)
- James R. Wallace (University of Waterloo)

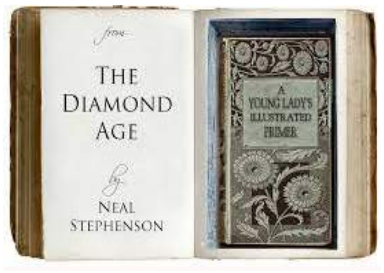
Ongoing Research Projects

To facilitate my research program at CSUMB, in 2015 I founded CSUMB Game Research Lab. The lab engages in human-computer interaction projects, game design projects, sensors and robotics projects, and machine learning projects – as they relate to virtual and augmented reality medium.

UniVResity.org – real-time classroom participation through VR

UniVResity.org uses the webVR app, which allows for real-time class participation by remote classmates. A virtual reality version of the ongoing face-to-face class is generated automatically, in real-time. Using only the instructor's voice as input, deep neural networks generate lip-sync and face-expression animation, non-verbal communication cues, gestures, and the teacher's avatar movement. The remote student is represented in class as an avatar projected onto the whiteboard. The whiteboard becomes a shared space of interaction between the instructor and the remote students. Collaboration on group activities is also possible, with the remote student using local student's tablet or laptop as a shared interactive surface.

The project investigates alternative representations of users and their interaction in the context of mixed reality systems. It explores automatic translation of user representation and interaction when medium and modes of input used by each user are different. I applied for the NSF CAREER Award for this project.



Young Lady's Primer – sensor-driven visual storytelling

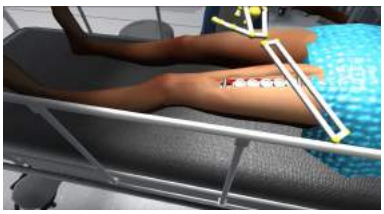
In the Sci-Fi novel "Diamond Age," author Neal Stephenson envisioned "Primer", children's book equipped with AI capable of continuously monitoring mental state of a child. The role of the AI was to compute engaging and educative stories that help bringing the child up. In this research, we attempt to re-create this device using deep neural networks and wearable sensors: EEG, EMG, GSR, IMU.

Ractive – participatory VR theatre

The same author, Neal Stephenson envisioned "Ractive" as an interactive VR-based participatory theatre. While traditional theater was a spectacle for an audience to watch, experimental theaters of Grotowski introduced a concept that the audience becomes part of the play. Using room-scale VR systems as a medium, we design and evaluate collaborative theater experience, where professional actors perform improvised or scripted stories with the active participation of the audience.

Flex – wearable sensor enabling VR/AR interaction for users with partially amputated limb

In this project, we design an open-source low-cost muscle extension and flexion sensor capable of recreating movement of the missing part of the limb. We apply the sensor to enable spatial interaction in VR/AR by providing users with a virtual limb they can control.



Low-cost mobile VR surgery simulator with haptic feedback

In collaboration with the Graduate School of Medicine, Kyoto University, we are designing a low-cost mobile-based surgery simulator with haptic feedback. Our goal is to bring the benefits of virtual reality surgical training to developing countries and universities that cannot afford the larger and more expensive VR systems.

Royal Game Of Ur

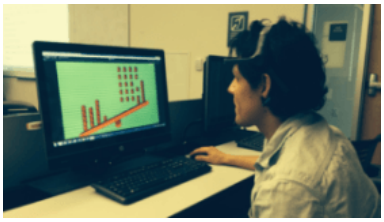
Student investigators: Sophia Rose, Ryan Blackman, Morgan Johnson

The Royal Game of Ur is one of the oldest known board games, popular during the reign of Assyrian empire, its rules recently deciphered from a cuneiform tablet by the curator of the British Museum, Dr. Irving Finkel. In this project, the player plays the Royal Game of Ur in VR against Sargon of Akkad, Assyrian king, in a historically accurate setting.

VR Wildfire Prevention

Student investigators: Jessica Vega, Alex Ruvalcaba, Adrian Martinez, Josh Patrick, Adrian Kus, Taylor Romo, and Brieg Oudeacoumar

Wildfire Prevention VR is a virtual reality simulation of preventing campfires from turning into wildfires and is meant to be played on the HTC Vive. The objective of the game is to finish the camping trip without starting a wildfire.



Improving proportional reasoning of children with ADHD

In collaboration with School of Health and Health Systems, University of Waterloo, using low-cost EEG Brain Computer Interface, this project aims at improving proportional reasoning of children with ADHD. The game adapts the difficulty of the proportional reasoning, LEGO-balancing task based on the attention level of the player as provided by the BCI device.

Flora Robotica – societies of symbiotic robot-plant bio-hybrids

Flora Robotica is a large, interdisciplinary project sponsored by an EU consortium of several universities. Our role in the project is to design virtual reality simulators for plant-robot interaction, and implement swarm grammar-based models of plant growth. The simulation allows for inspecting the site in the future to verify whether it was developed by swarm robots in accordance with the architects' vision.

Don't Blink – BCI game improving memory

Student investigator: Jessica Vega

This 2D puzzle platformer relies on the player to memorize a path to the exit and then navigate through the level in total darkness. The player will be able to memorize the level for as long as they are able to refrain from blinking, but once they do, the game – and the challenge – begins.

Aircycle – mobile VR exergame

Student investigator: Daniel Kharlamov, Alexander Sheehy, Bianca Jaramillo

Aircycle is a mobile VR exergame in which players fly a human powered aircraft through a canyon. By using a custom-designed strap-on Bluetooth sensor, users directly affect the craft's speed through leg movement.

Over-the-Table - freehand interaction with large horizontal surface

Student investigator: John Sullivan

In this project we design and build a large interactive, auto-stereoscopic table enabling freehand, above-surface interaction. We investigate above the table interaction techniques, occlusion management, and eye convergence problem.

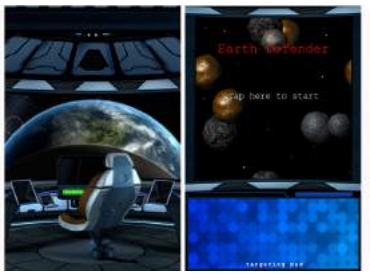
Game Projects

As a lead game designer in KPicture Productions film and game studio, I designed and developed a number of mass interaction games.

"Little Red Riding Hood" Interactive Cinema Storybook

Game design: Krzysztof Pietroszek
Developers: Krzysztof Pietroszek, Kurt Schwarz
Arts: Michael Jeong, Daniel Manzali, Julia Jang, Karen Benetzen

An interactive storybook for young movie theatregoers. Released at the *Children's Film Festival* in Waterloo, Canada.



"Earth Defender" Mobile Game

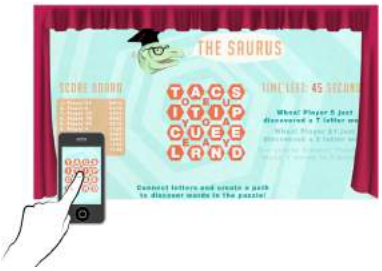
Game design: Krzysztof Pietroszek
Developer: Krzysztof Pietroszek
Arts: Michael Jeong

The first mobile game to use spatial correspondence targeting interaction technique designed and published by me at the MobileHCI'12. The game was created and used to collect a large experimental data set.

"Trivia Time" Interactive Cinema Game

Game design: Krzysztof Pietroszek
Developers: Krzysztof Pietroszek, Kurt Schwartz
Arts: Michael Jeong

Developed in HTML5 + JavaScript + AIPFramework for the CineClick Audience Interaction Platform. Customizable trivia game developed for movie theatre audiences. Financed by Canada Media Fund.



"The Saurus" Interactive Cinema Game

Game design: Krzysztof Pietroszek
Developers: Krzysztof Pietroszek, Mike Patterson, Kurt Schwartz
Arts: Michael Jeong

A mass-interaction word-finding game for movie theaters. Mobile phone serves as a second screen on which the player finds a word. The results are visualized on the cinema screen.

"Banzai Ball" Interactive Cinema Game

Game design: Krzysztof Pietroszek
Developers: Krzysztof Pietroszek, Mike Patterson, Kurt Schwartz
Arts: Michael Jeong

A mass-interaction action game for movie theatres. Audience is divided into two teams. Mobile phone serves as a game controller from which the users eject a banzai. The action is shown in real time on the cinema screen.

Ninja Robotos vs. Zombie Pirates

Game design: Michael Jeong
Developers: Krzysztof Pietroszek, Kurt Schwarz
Arts: Michael Jeong

In this mass gaming experience for cinemas, players first define a role for their character (either a Ninja Robot or Zombie Pirate) and then observe how the gameplay unfolds on the cinema screen.

New Media Projects

As a designer and lead developer in KPicture Production, I created a number of new media projects, ranging from interactive cinema platform to immersive telepresence systems. Each project had both technical and artistic elements.

CineClick – Audience Interaction Platform

Designer & Technical Lead: Krzysztof Pietroszek
Developers: Kurt Schwarz, Mike Paterson, Steven Vincent

CineClick enables second screen experience. Moviegoers actively participate with a theatre display playing mass interactive games during the pre-show period using mobile devices as game controllers.

MixMasher — Research Collaboration App (iOS)

Design & development: Krzysztof Pietroszek

Developed for the University of Waterloo, MixMasher is an iPad app allowing for easy sharing of research materials: videos, data, charts, and documents, between members of a research group or a wider research community. MixMasher enhances collaboration between researchers, and increases research results dissemination.

Apptui.com prototype — Mobile Remote Controller

Design & prototype: Krzysztof Pietroszek, Pavel Sakun
Graphics: Dan Clark (client)

In this project, developed for Moonray Studios, I have designed a functional prototype of a browser-based mobile remote controller for computer screens. The interface adapts to the app currently running in the browser, enabling a custom user interface for any website.

EverySlide.com — Interactive Slideshows Online

Design & prototype: Krzysztof Pietroszek
Developers: Kurt Schwarz, Thomas Perunsky

Online presentation tool that synchronizes slides across all connected devices. Each slideshow creates a unique URL, which anybody with a browser can use to connect to slides, interact, answer quizzes, and provide a feedback.

NetClick — Student Response System

Design & prototype: Krzysztof Pietroszek
Developers: Krzysztof Pietroszek, Thomas Perunsky

Webapp designed to replace iClickers with mobile devices. It allows for the creation of ad hoc quizzes, check students' attendance, define regions of slides that constitute a correct or incorrect answer. The tool gained significant popularity.

Glass — Immersive, Interactive Telepresence System

Design & prototype: Krzysztof Pietroszek

Developed with the support of Christie Digital Systems, Glass Telepresence is about making remote communication feel natural, as if the participants were in the same room. The uniqueness comes from a proprietary synchronization system that provides true eye to eye contact and life-size scale and perspective, which allows communicators from remote locations to feel more "present".

Film and Theatre

To date, I have produced a theatrically-distributed feature film, and written-directed a number of short films and documentaries.

Waiting for Summer

Deature film, written & directed by Senthil Vinu
Starring Caleb Verzyden and Virginia Leigh
Produced by Krzysztof Pietroszek and Senthil Vinu

A story of the intertwined destinies of Zach and Chantal who are each looking for a new beginning in their life, while trying to overcome difficult childhoods. Their lives collide, becoming inexplicably connected in ways neither could have imagined. Along the journey, they discover that healing wounds comes at a cost.

Best Drama, Hamilton Film Festival
Best Actress, Hamilton Film Festival
Best Feature Film, Film North Huntsville International Film Festival
Official Selection, Edmonton International Film Festival
Official Selection, Canadian Film Festival
Official Selection, Mississauga Independent Film Festival

Theatrically distributed in Canada

Return

3 min, experimental
Written, directed & filmed by
Krzysztof Pietroszek
Starring Boaz Berri

Experimental exploration of the memory of lost time. Filmed in a continuous shot played backward.

Split

5 min, mockumentary
Written, directed & filmed by
Krzysztof Pietroszek
Starring Alex Plakhov

An Iraq veteran tells his story at the Toronto Downsview Subway station to a random person. This social experiment mockumentary explores how humans deal with post-traumatic disorder.

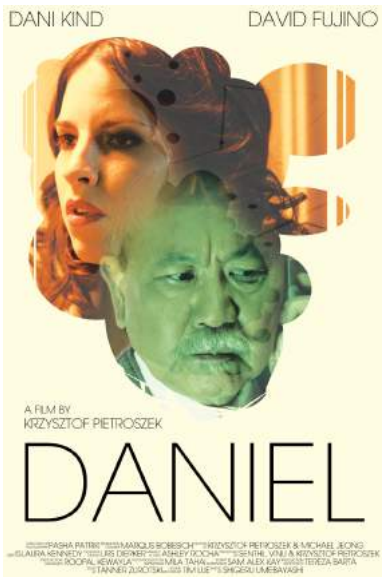
The Magic of Shamans

30 min, TV documentary
30 min, TV documentary
Written, directed and filmed by
Krzysztof Pietroszek

This documentary explores shamanism across cultures, from Ukrainian "babushkas", to Japanese "itako", to Huichole's Peyote shamans.

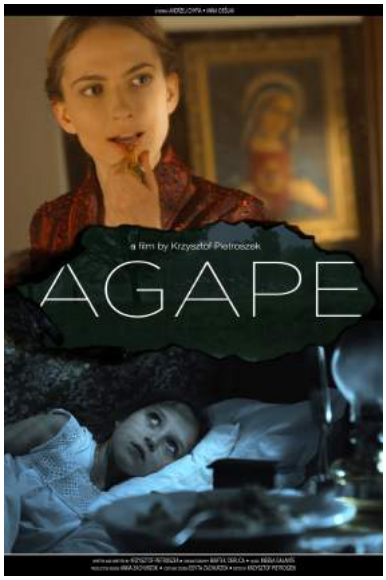
10 min, comedy
Written & directed by K. Pietroszek
Starring Sean Cullen
Cinematography by Pasha Patriki

"Don't be yourself!" advises a handsome museum guard to a not-so-pretty one, when the latter tries to win the heart of beautiful Mila... Is there a way to stay true to your values (like daily hamburger and coke) and still get what your heart desires?



12 min, drama
Written & directed by Krzysztof Pietroszek
Starring Dani Kind and David Fujino
Cinematography by Pasha Patriki

"Daniel" is a story of the primordial fear of loneliness in face of death. This semi-comic and bitter-sweet film tells the story of an old, dying man, a young call girl and their encounter. Can intimacy be purchased? How far will a man go to avoid his loneliness?



Half-off war drama
Written & directed by Krzysztof Pietroszek
Starring Andrzej Chyra, Anna Cieslak
Cinematography by Bartek Cierlica

It is 1943 in Nazi-occupied Poland. Anna, a widow, develops a relationship with a Nazi Luftwaffe officer. Anna must decide whether to give up on basic human values and submit to passion or risk her life by saving a Jewish boy, thus breaking Nazi law.

5 min, experimental
Written & directed by Krzysztof Pietroszek
Starring Jane Wong
Cinematography by Colin Akoon

Postmodern commentary on the biblical story of Eve and the Forbidden Fruit, and its use as a justification for the oppression of women throughout history.

Festivals Selections and Awards

- Short Film Corner, Cannes International Film Festival (representing Canada)
- Best Drama, Hamilton Film Festival
- Best Actress, Hamilton Film Festival
- Best Feature Film, Film North Huntsville International Film Festival
- Official Selection, Edmonton International Film Festival
- Official Selection, Canadian Film Festival
- Official Selection, Mississauga Independent Film Festival
- Official Selection Tulsa International Film Festival
- Film Producer Accreditation, Cannes International Film Festival
- Film Producer Accreditation, Toronto International Film Festival
- Official Crystal Palace International Film Festival
- Official Selection "In the Palace" International Film Festival
- Official Selection Kratkofil International Short Film Festival
- Official Selection Detmond International Film Festival
- Official Selection Srebrena Traka International Film Festival
- 3rd Audience Award: Multicultural Film Festival, Canada (fine arts)
- 2nd Prize, Polish Theatre Competition
- Poland (arts) Grand Prix, International Festival of Young Theatre Artists, Poland
- Finalist of National Polish Language and Literature Olympiad, Poland

Theatre Acting and Directing

- Rehearsals, dir. Krzysztof Pietroszek
- Little Prince, dir. Kuba Abrahamowicz
- Crime and Punishment, dir. Kuba Abrahamowicz
- Cabaret of Elders, dir. Kuba Abrahamowicz
- The Song of Roland, dir. Kuba Abrahamowicz

Photographic Exhibitions

I am a hobby photographer. Some of my arts and travel photographs were exhibited in my home town gallery:

- Life and Death (2008)
- North India (2007)
- Mongolia (2006)
- Middle East (2005)

Creative Writing

I have written a number of screenplays, some of which were produced. I also worked as a part-time journalist in Poland, writing reports for travel magazines about my backpacking trips to over 60 countries worldwide. I also wrote technology reviews articles. Recently, I published a series of books for young children.

Screenplays

- Agape, half-off TV drama screenplay
- Daniel, short screenplay
- Greenscreen, short screenplay
- Split, short screenplay
- Eve, short screenplay
- Return, short screenplay
- Photographer, feature-length screenplay
- Layla, feature-length screenplay, written with Anne Opotowsky
- Ten, short film
- 2BR02B, adaptation of Kurt Vonnegut's short story

Children's Books

- Greeny, the Brave Oak Leaf
- The Lamp and the Candle
- The Knife and the Spoon
- The Stone in a Cave

Press

During my undergraduate and graduate studies, I worked as a student journalist. I published travel and technical articles. I have served as the Editor-in-Chief of *The Fencer*, the University of Wroclaw student magazine and worked as an investigative journalist for *The Cord Weekly*, WLU's student magazine.

- Searching Mexico for Shamans. *The Cord Weekly*, WLU.
- Best Web Crawlers. *WWW Magazine*
- Survey of Email Clients. *WWW Magazine*
- Hitch-hiking through the World: Ukraine. *The World of Travels*
- Mongols, Nomads of Wild Steppes. *The World of Travels*
- Mongolian savoir-vivre. *Oddysei Travel Magazine*
- The Adventures of Johnny Walker. *The Fencer.* University of Wroclaw
- The Limits of Art, monthly column. *The Fencer.* University of Wroclaw

Press Mentions and TV Interviews

- **Beyond Gaming: Taking Augmented Reality to the Next Level** CSU News
  The article discussed uses of Augmented reality for applications other than gaming.
- **New Reality** CSUMB Magazine
  The article features a number of research ongoing research projects of Game Research Lab
- **Two New Businesses Ask Players to Ditch their Cellphones** Monterey Weekly
  The article confronts new escape room businesses with my commentary on the future of VR and AR
- **Polish Producer Talks about his Canadian Feature Film (in Polish)** Gazeta Gazeta
  The article discusses "Waiting for Summer" film and my other movies
- **"Agape" Attracts Crowds of Audiences (in Polish)** Ox.pl
  The review of the premiere of my half-off World War II drama
- **Meet the Filmmaker - TV Interview** Ontario TV
  The interview with me about the reappearing themes in the films I make

Teaching Experience

In the first five semesters of my appointment, I taught 14 different courses, of which 11 I have designed. As indicated in my teaching evaluations, and ratemyprofessor.com, I am among the highest ranked instructors at CSUMB. My rating at ratemyprofessor.com is 4.8/5, while my CSUMB rating is 4.5/5 (median rating is 3.3/5), with a teaching load 5-5 per year, including teaching overload.

As Assistant Professor

I have designed and taught the following courses related:

- CST 321 Game Design I: Entertainment Games
- CST 421 Game Design II: Serious Games
- CST 306 Game Engine Programing
- CST 326 Game Development
- CST 426 Advanced Game Development
- CST 495 Special Topics: Advanced Game Design
- CST 495 Special Topics: Adv. Game Development
- CST 497 Independent Study: Cryengine
- CST 497 Independent Study: Motion Capture
- CST 496 Directed Study: Game Design Capstone
- CST 497 Independent Study: 3D Modeling in Rhino

Additionally, I taught the following courses:

- CST 238 Introduction to Data Structures
- CST 336 Internet Programing
- CST 325 Graphics Programing

As Sessional Instructor or Teaching Assistant

- CS 446 Software Design and Architecture
- CS 445 Software Requirements Specification
- CS 105 Introduction to ANSII C programming
- CS 136 Algorithm Design and Data Abstraction
- CS 792 Data Standards in Health Informatics
- CS 135 Designing Functional Programs
- CS 446 Software Design and Architecture
- CS 106 Introduction to Programming in Pascal
- ECE 355 Software Engineering
- ECE 452 Software Design and Architecture
- ECE 451 Software Requirements Specification
- ECE 354 Software Testing
- FILM 1900 Anatomy of the Feature Film
- FILM 2010 Film and Video Production

Student Mentorship Experience

To date, I have advised 32 undergraduate and graduate research assistants. Below, I present a list of notable (published, or commercialized) projects:

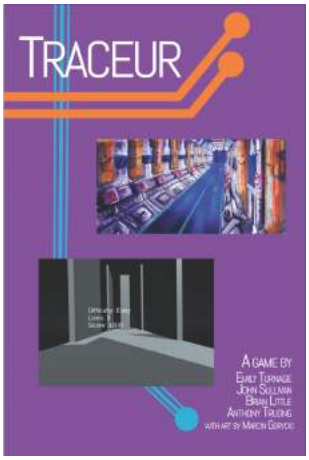
- **Sophia Rose, junior, Marine Science** CSUMB, 2017-2018
  Augmented Reality Application for Exploration of California coast underwater GIS Data
- **Phuc Pham, junior, Computer Science** CSUMB, 2017-2018
  Dynamic Time Warping implementation on Compute Shaders
- **Theodore Ebenhoech, junior, Computer Science** CSUMB, 2017-2018
  UniVResity.org – real-time classroom participation through VR
- **Mathew Thomberlin, junior, Computer Science** CSUMB, 2016
  Gauntlet VR navigation technique
- **Matthew Johnson, senior, Computer Science** CSUMB, 2015-2016
  Low-cost latency compensation for VR
- **Kataryna Morayko, senior, Cognitive Science** CSUMB 2016
  Variable vs. constant latency study

- **Brian Zimmerman, senior, Computer Science** CSUMB 2016
  Variable vs. constant latency study
- **Brandan Lockwood, senior, Computer Science** CSUMB 2016
  PinThought – EEG-based authentication
- **Xiuan Dong, senior, Computer Science** CSUMB 2016-2017
  PinThought – EEG-based authentication
- **Joshua Shallow, senior, Computer Science** CSUMB 2016-2017
  Low-cost Latency Compensation for VR
- **John Sullivan, junior, Computer Science** CSUMB 2016-2017
  Activity Recognition in VR
- **Brian Geiger, senior, Computer Science** CSUMB 2016-2017
  UniVResity open VR education platform
- **Brandon Woodard, junior, Computer Science** CSUMB 2016-2017
  TickTockRay – 3D pointing interaction technique
- **Daniel Kharlamov, sophomore, Computer Science** CSUMB 2016-2017
  TickTockRay – 3D pointing interaction technique
- **Kevin Brock, senior, Computer Science** CSUMB 2016-2017
  "The Third Law" Virtual Reality Game – capstone project
- **Marcus Dixon, senior, Computer Science** CSUMB 2015-2016
  "Knock-off" Virtual Reality Game – capstone project
- **Alexander Shechy, senior, Communication Design** CSUMB 2016-2017
  "Tainted Sea" Virtual Reality Game – capstone project
- **Jackson Culp, senior, Communication Design** CSUMB 2016-2017
  "Tainted Sea" Virtual Reality Game – capstone project
- **Robert Macias, senior, Computer Science** CSUMB 2015-2016
  "Knock-off" Virtual Reality Game – capstone project
- **Harrison Oglesby, senior Computer Science** CSUMB 2015-2016
  "Knock-off" Virtual Reality Game – capstone project
- **Ian Kindal, senior, Communication Studies** CSUMB 2016-2017
  "Riotous Space Brawl" Virtual Reality Game – capstone project
- **Peter King, senior, Communication Studies** CSUMB 2016-2017
  XIX century Paris – 3D modelling in VR – capstone project
- **Ariel Weingarten, senior, Software Engineering** University of Waterloo, 2014-2015
  Watchcasting: using smartwatch to interact with large screens
- **Steven Vincent, senior, Engineering** University of Waterloo, 2014-2015
  Games in Movie Theatre: Android-based cinema gaming server
- **Meisam Mohammadtaheri, freshman, Engineering** University of Waterloo, Spring 2013
  Quality Assurance for NetClick Student Response System
- **Sandeep Patel, freshman, Engineering** University of Waterloo, Spring 2013
  Testing of NetClick Student Response System
- **Amir Tavakoli, freshman, Engineering** University of Waterloo, Summer 2013
  Quality Assurance for CineClick Interactive Cinema
- **Hermon Gebremariam, freshman, Engineering** University of Waterloo, Summer 2013
  Testing of CineClick Interactive Cinema Platform
- **Theresa Tomas, graduate student** University of Waterloo, Fall 2010
  Glass Telepresence – Telepresence System Preserving Eye to Eye Contact

- **David Farr, graduate student** — University of Waterloo, Fall 2010
  Glass Telepresence – Telepresence System Preserving Eye to Eye Contact
- **Gabriel Tomescu, graduate student** — University of Waterloo, Fall 2010
  Glass Telepresence – Telepresence System Preserving Eye to Eye Contact
- **Tatiana Koba, third-year, undergraduate student** — Nikolaiv State University, Summer 2010
  Assessing Language Proficiency using Artificial Intelligence Assistant

Mentorship of Student Games

Over the last 2 years, I have supervised 26 student games projects. Below I present notable examples, most of which were developed for mobile or desktop virtual reality systems.

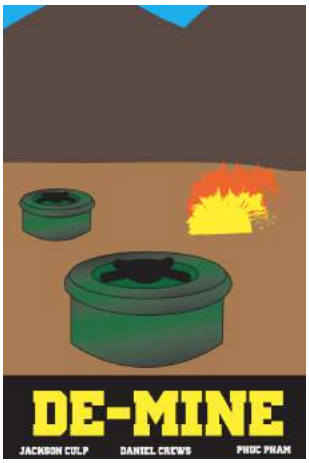


"Traceur" — Mobile VR Exer-game

Game Designer: Emily Turnage
Developers: John Sullivan, Brian Little, Anthony Truong
Arts: Marcin Gorycki
Hardware platform: Samsung Gear VR, Samsung Galaxy S7

Traceur is a mobile VR exergame that combines the fun of more traditional 'endless runner' games with the get-up-and-go nature of the Gear VR. The game is designed to encourage physical exercising. Using the built-in motion sensors of the phone Traceur tracks player movements and, once calibrated, lets the player navigate an endless runner style gauntlet by jogging, dodging in place, and jumping.

Available at: http://csumb.itch.io/traceur



De-Mine — VR Mine Defusing Simulator

Game Designer: Jackson Culp
Game Developers: Daniel Crews, Phuc Pham
Hardware platform: HTC Vive

In De-mine, the player is charged with the task of clearing out minefields to prevent harm to the local animal life. From the first person perspective, players experience the tension of navigating a dangerous minefield, removing the mines from the ground, and then carefully disarming them.

Available at: http://csumb.itch.io/de-mine

Tainted Sea VR

Game Designer: Alexander Sheehy, Jackson Culp
Game Developers: Morgan Johnson
Hardware platform: Oculus Rift CV1

Tainted Sea is a simulator/action game that takes place in a future where a deadly super-organism, known only as the "Tainted One" threatens to destroy and consume all life on the planet. Using an advanced sub, players will embark on a series of missions that take them into the tainted sea's dark depths. With only their sub's headlights and sonar to guide them, players will need to keep their wits about them as the tainted organism is about to attack any time.

Available at: http://csumb.itch.io/tainted-sea

The Third Law VR

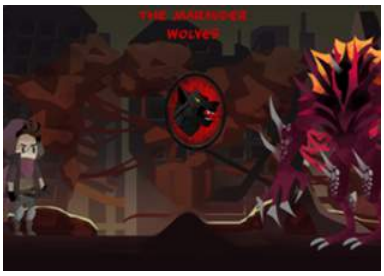
Game Designer: Kevin Brock (currently at Human Head Studios)
Hardware Platform: PC (Cryengine), HCT Vive

Players take on the role of the world's first scientist, who seeks to understand the generated laws of their world. Players are tasked with diagnosing the properties of objects they recover, learning the process of scientific discovery. With each game execution, new sets of physics laws are generated.

Riotous Space Brawl VR

Game Designer: Ian McKillop
Hardware Platform: PC (Unity 5), Oculus Rift

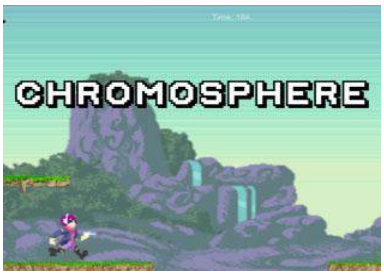
The objective in Riotous Space Brawl is to protect the player's home planet from invasion. The player proceeds through a stage of the game, shooting down enemies along the way, until they reach the end of the level. Upon arriving at the end, a boss will appear and the player destroys them.



The Marauder Wolves

Game Designer: Benjamin Kung
Hardware Platform: PC (Unity 5)

The Marauder Wolves is a platformer game, where two warriors face off against monsters in a post-apocalyptic world. All of the artwork and sound design were done by very talented visual design students from the University of Silesia, while design and programming were done by CSUMB students.



Chromosphere

Game Designer: Christine Ladra
Platform: Android and iOS (Unity 5), procedurally generated levels

Chromosphere is a bright, fast paced, side scrolling shooting game It is a classic fast paced arcade game that makes the player engaged, excited, on edge, yet comfortable at the same time. The mechanics and rules of the game are fairly simple and straightforward, making it easy to get into.

Enkindle

Game Designer: Emily Turnage
Hardware Platform: PC (Unity 5),

Enkindle is a 3D, procedurally generated open map RPG in which the player takes on the role of a phoenix that blooms to life in a forest held in winter's icy grasp. The heart of Enkindle lies in how the player chooses to transform the landscape to their liking.

Rouge World

Game Designers: Jacob Esquivel, Riley Peralta
Platform: PC (Unity 5), NPC animations via motion capture

Rogue World is a battle for humanity against an alien force. Explore a tunnel system while fighting enemy aliens armed with only a gun and knife. Defeat the aliens, solve puzzles, and find secret rooms, all while exploring this underground maze.

Gourmet Quest VR

Game Designer: Toutoua Vang
Hardware Platform: Oculus Rift + Leap Motion

Gourmet Quest is a virtual reality-cooking simulator. The player starts as a street side vendor who cooks up delicious and challenging dishes and pursues their dream of becoming an owner of restaurant franchise. With the application of Leap Motion, the player uses their own hands through the entire cooking process.

Galactic Explorer

Game Designer: Jackson Culp
Hardware Platform: PC (Unity 5)

Galactic Explorer is a science fiction game that captures the thrill of exploration. The player must fly a spaceship through an uncharted solar system in search of habitable planets for colonization. There are dangers within space, but the explorer is equipped to counter all the threats.

Just One Night VR

Game Designer: Victoria Arreola
Hardware Platform: Oculus Rift + Leap Motion

Just One Night is a virtual reality spatial input horror game. The player is trapped within a two-story mansion with only a flashlight to defend themselves against paranormal entities. The player must find keys in each room of the mansion, while remaining quiet to avoid provoking any malevolent spirits that may be lurking.

World 1-1

Game Designer: Jon Pacha
Platform: PC (Unity 5)

The player must race to the end of the level before time runs out and the portal back to their home dimension closes. The Player must avoid the hazards and enemies and gather the collectibles to improve the final score. Each level has identical layout, but increased number of threats and obstacles.

Professional Memberships

- Association of Computing Machinery (ACM)
- Institute of Electrical and Electronics Engineers (IEEE)
- Academy of Canadian Cinema and Television ("Canadian Oscars" Academy) — voting member
- International Game Developers Association (IGDA)
- Digital Games Research Association (DiGRA)

Community Service

- Volunteer at Capuchin Mission, Dar-es-Salaam, Tanzania
- Volunteer at "Hope", a NGO-run centre for children with Down Syndrome, Chybie, Poland

Hobbies

Playing Piano, Horse Riding, Climbing, Mountaineering, Backpacking, Tennis, Volleyball, Swimming, Photography