

University of Northern Colorado

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### Anna Ursyn: Computer Graphics, Digital Media, Knowledge Visualization, Concept Art and Digital Illustration

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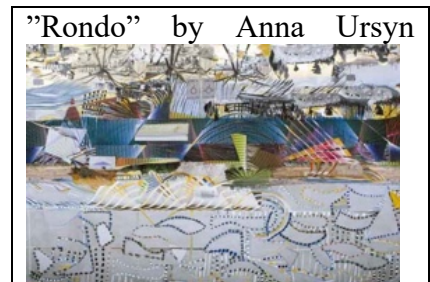
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2020 Research Day – University of Northern Colorado



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**Anna Ursyn: Computer Graphics, Digital Media, Knowledge Visualization, Concept Art and Digital Illustration.**

The leading line of her work is in linking various areas of art and science through collaboration with specialists. I am inviting those who would like to collaborate with me on interdisciplinary projects.

Recent themes of my work include:

The project Biologically inspired computing in the arts: micro-organisms in water was developed during my previous sabbatical leave. I published the results in a book under this title, and shared the results with my graduate student Jingying Zhen , Crystal. She developed sketches, brush painting, wireframes for her 3D printed sculptures, videos and a website, all based on her research and collaboration with the Department of Biology. She had an exhibition: "Small Universe" at the Mariani Gallery at the Guggenheim Hall.



I described some of the outcomes of my research in the book:  
Graphical Thinking for Science and Technology Through Knowledge Visualization  
(Advances in Multimedia and Interactive Technologies) 2020



– A Carbon project

Project ‘Carbon’ was developed during my sabbatical leave. It started as a website. Carbon.Ursyn.com. It was also supported by CETL. This work comprised:

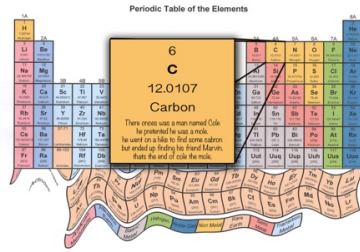
- Installation and video project about carbon
- A fullerene project
- My research outcomes were converted into assignments for the students in Computer Graphics and Digital Media:



Carbon by Jennifer Funnell, Graduate student in Computer Graphics, print on alluminum



Arthur Bugarin Correa created his poetic illustration.

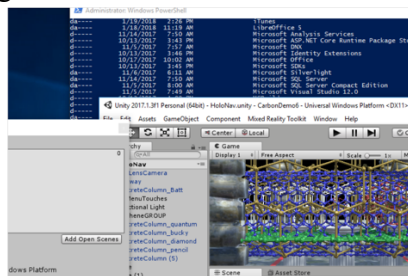


Grant Stout wrote an illustrated Limerick about Carbon

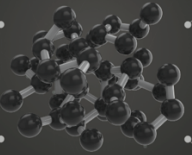
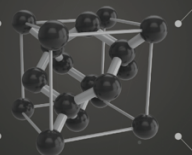
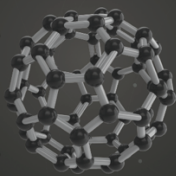
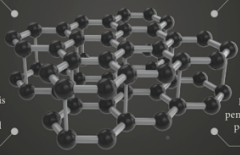


Cody Johnson illustrated his poem in order to transform it into a t-shirt.

– A Hololens project executed with a visual reality (VR) technique. Example of a CETL-sponsored collaborative project with Jeremy Hansen, an interdisciplinary student CS/Art&Design



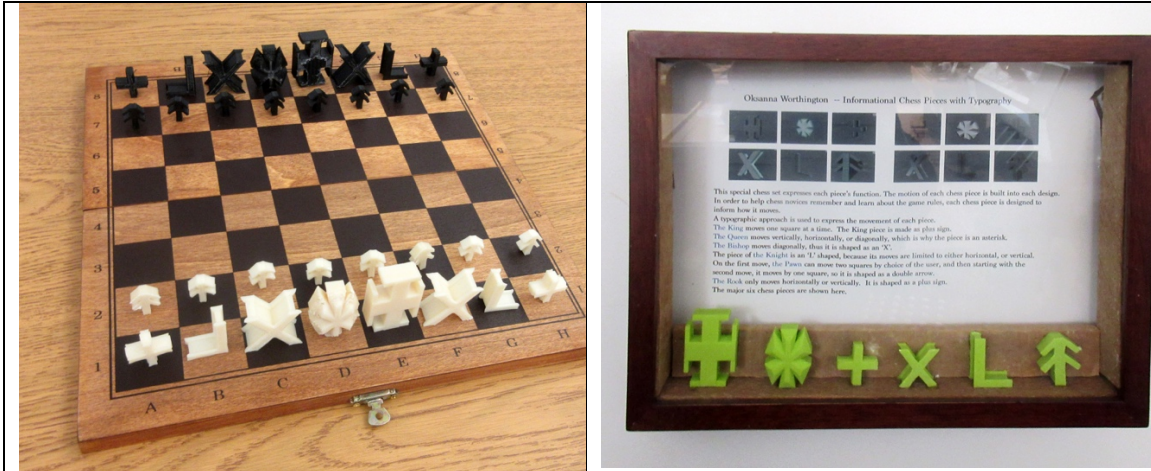
I shared research data with my graduate student in Digital Media which resulted in the Master of Arts thesis by Zahra Alsukairi entitled “Communicating through Information Graphics: Carbon Properties and Uses.” Student work presented here includes four infographics about forms of carbon. Zahra had her masters degree show “Carbon” at the Mariani Gallery in the Spring 2019.

<h2 style="text-align: center;">Amorphous Carbon</h2> <p>Amorphous Carbon has no specific atomic structure</p> <p>Formed when burning a material containing carbon without enough oxygen</p> <p>For example: Carbon black, which is used in tires and black ink</p> <p>For example: Charcoal</p>  <p><small>Wolke, B. L. (2015). Carbon. In K. L. Lauer &amp; W. Lauer (Eds.), The Gale Encyclopedia of Science (Vol. 4), 104-110. Retrieved from Gale eBooks. doi:10.1080/10804125.2015.10804125</small></p> <p style="text-align: right;"><small>Designed by: Zahra Alshakr</small></p>	<h2 style="text-align: center;">Diamonds</h2> <p>Diamonds are the hardest-known natural material</p> <p>Used in drilling tips to drill through human teeth at the dentist's office</p> <p>The molecular structure is a cubic lattice form</p> <p>Used in drilling tips to drill through rocks in oil fields</p>  <p><small>Wolke, B. L. (2015). Carbon. In K. L. Lauer &amp; W. Lauer (Eds.), The Gale Encyclopedia of Science (Vol. 4), 104-110. Retrieved from Gale eBooks. doi:10.1080/10804125.2015.10804125</small></p> <p style="text-align: right;"><small>Designed by: Zahra Alshakr</small></p>
<h2 style="text-align: center;">Fullerenes</h2> <p>Fullerenes have many properties and are used in various fields</p> <p>One of the most commonly known fullerenes is Buckyball or C60</p> <p>The molecular structure is consists of hexagons and pentagons</p> <p>Some types of fullerenes are used in photovoltaic solar panels and for MRI machines</p>  <p><small>Li, M., &amp; P. S. Kumar (2009). Structure, properties and applications of fullerenes. International Journal of Nanotechnology and Applications, 1 (1), pp. 1-16. ISSN 0973-013X</small></p> <p style="text-align: right;"><small>Designed by: Zahra Alshakr</small></p>	<h2 style="text-align: center;">Graphite</h2> <p>Graphite is one of the softest materials</p> <p>Conducts electricity and resists extremely high temperatures</p> <p>The molecular structure is consists of sheets of carbon atoms connected in a hexagonal pattern.</p> <p>It is used to produce pencils and it is what gives pencils their dark gray color</p>  <p><small>Wolke, B. L. (2015). Carbon. In K. L. Lauer &amp; W. Lauer (Eds.), The Gale Encyclopedia of Science (Vol. 4), 104-110. Retrieved from Gale eBooks. doi:10.1080/10804125.2015.10804125</small></p> <p style="text-align: right;"><small>Designed by: Zahra Alshakr</small></p>

– A Virtual Reality system came from a grant from the zSpace supported project made in a collaboration with various professionals in the field of geology presentation resulted in a time-based exploration of our planet.



– Introducing 3D printing into my curriculum:  
Examples of student projects presented here include transformed chess figures created by Oksanna Worthington



Oksanna Worthington was asked to design and then print a 3-D printed model of a chess set that carries information for a chess-novice about particular moves embedded into their designs. She chose to apply typographic approach for this task.

She followed with a story-based animation.



A model of a poem supported atom produced by Angelica Nolen, employed by the Aleph Objects 3D printing Open Source company well known for their Lulzbot machines (30 miles from the UNC) before her graduation, soon after she was promoted as a Research and Development specialist, answering directly to the CEO of the company.



– A Myro project. Collaborations with computing specialists involved students from Computer Science, interdisciplinary students CS/Art and Art students; it resulted in a Myro project, where students coded a Myro - a drawing robot which followed a trajectory designed by the students.

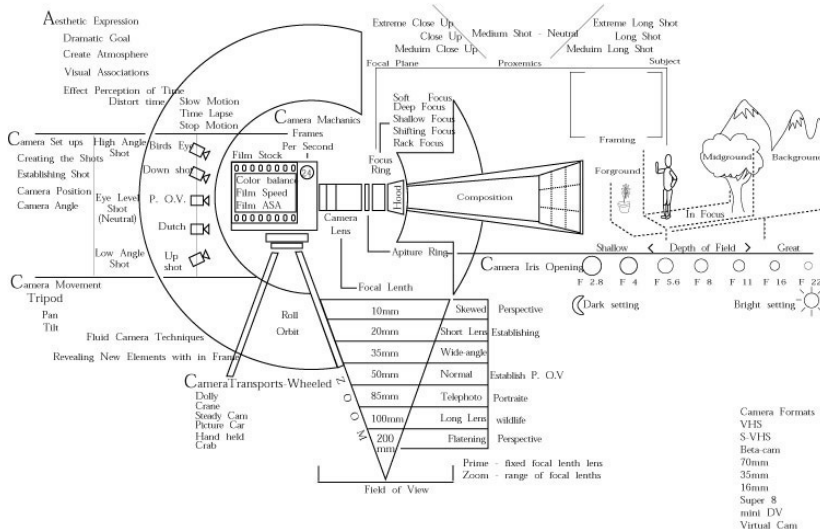


Corwin Bell, a Master of Art student in Computer Graphics developed biofeedback game “Journey to the Wild Divine”, used globally by doctors. According to the game panelists at the ACM SIGGRAPH conference on Computer Graphics and Interactive Techniques, the first computer-based biofeedback game in the world.



Below, is his informatic explaining complex information in a simple, yet effective way.

## Cinematic Mass Option Syndrome



I co-authored of a book “*The Art of Coding: The Language of Drawing, Graphics, and Animation*” (2020), by Mohammad Majid al-Rifaie, Anna Ursyn, & Theodor Wyeld. CRC Press, Taylor and Francis Group. We cover strategies used at the three different continents.

My other books (as an author or author/editor) are:

1. Biologically-Inspired Computing for the Arts: Scientific Data through Graphics  
Anna Ursyn (Author/Editor). © 2012. 442 pages.

<http://www.igi-global.com/book/biologically-inspired-computing-arts/60763>

ISBN13: 9781466609426. DOI: 10.4018/978-1-4666-0942-6

2. Computational Solutions for Knowledge, Art, and Entertainment: Information Exchange Beyond Text. Anna Ursyn (author). © 2014. 511 pages.

<http://www.igi-global.com/book/computational-solutions-knowledge-art-entertainment/77386>

ISBN13: 9781466646278. DOI: 10.4018/978-1-4666-4627-8



3. Perceptions of Knowledge Visualization: Explaining Concepts through Meaningful Images

Anna Ursyn (Author). © 2014. 418 pages

<http://www.igi-global.com/book/perceptions-knowledge-visualization/77405>

ISBN13: 9781466647039. DOI: 10.4018/978-1-4666-4703-9

4. Handbook of Research on Maximizing Cognitive Learning through Knowledge Visualization

Anna Ursyn (Author/Editor). © 2015. 572 pages.

<https://www.igi-global.com/book/handbook-research-maximizing-cognitive-learning/120092>

ISBN13: 9781466681422. DOI: 10.4018/978-1-4666-8142-2

5. Knowledge Visualization and Visual Literacy in Science Education

Anna Ursyn (Author/Editor). © 2016. 431 pages.

<https://www.igi-global.com/book/knowledge-visualization-visual-literacy-science/146991>

ISBN13: 9781522504801. DOI: 10.4018/978-1-5225-0480-1

6. Visual Approaches to Cognitive Education with Technology Integration.

A. Ursyn (Author/Editor) © 2018. 387 pages.

<https://www.igi-global.com/book/visual-approaches-cognitive-education-technology/188501>

ISBN13: 9781522553328. DOI: 10.4018/978-1-5225-5332-8

7. Interface Support for Creativity, Productivity, and Expression in Computer Graphics.

A Ursyn (Author/Editor) © 2019. 355 pages.

<https://www.igi-global.com/book/interface-support-creativity-productivity-expression/206546>

ISBN13: 9781522573715. DOI: 10.4018/978-1-5225-7371-5

8. Graphical Thinking for Science and Technology Through Knowledge Visualization (Advances in Multimedia and Interactive Technologies) 2020

<https://www.igi-global.com/book/graphical-thinking-science-technology-through/233809>

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