

Jupyter notebooks meet Traditional Coast Salish basket weaving

A collaboration between the Tla'amin Nation and Callysto

Laura Gutierrez Funderburk ¹

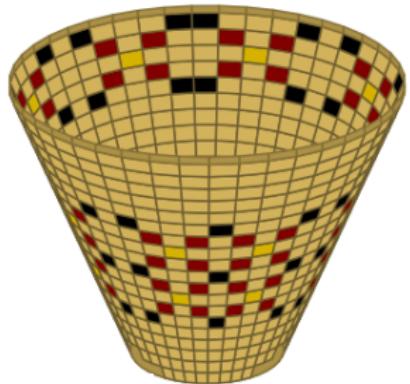
Simon Fraser University [1] School District 47 [2]

August 2019

*This is joint work Veselin Jungic ¹, Cedric Chauve ¹,
Betty Wilson ², Gail Blaney ², Tyler Peters ²,
Jennifer Pham ¹, Howell Tan ¹*

This work was conducted in the unceded, traditional and occupied territories of the xʷməəkwəy̓əm (Musqueam), Skwxwú7mesh (Squamish), Səl̓ílwətaʔɬ/Selilwitulh (Tsleil-Waututh) and Kwikwetlem Nations.

About The Collaboration



Math Catcher Outreach Program

About

Science outreach initiative run by SFU faculty, staff members and students who volunteer their time towards the program.

Goal

Tackle the stigma surrounding mathematics among Indigenous and non-Indigenous youth.

Learn more at <https://www.sfu.ca/mathcatcher.html>

Math Catcher Outreach Program



Prof. Veselin Jungic with Ms.
Betty Wilson



Illustration by Simon Roy

SFU Faculty Meet Tla'amin Nation



Prof. Jungic and Prof. Chauve meet Ms. Wilson, Ms. Blainey,
Mr. Peters (April 2018)

The Basket Models



Photographs by Alex Sutcliffe (April 2018)
Baskets Made by Tla'amin Nation Artists

About Callysto

Callysto is a free learning program for students in grades 5-12 in Canada. It is part of a two-year pilot project by Cybera and the Pacific Institute for Mathematical Sciences (PIMS).

Funded by the federal government's CanCode program.

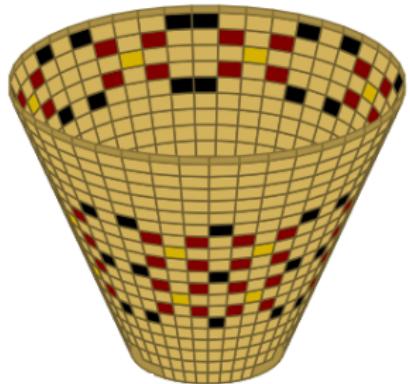
Goal: To help Canada's youth develop the foundational skills required to become the future drivers of innovation.

SFU Callisto Developer Team



(From left to right) Jennifer Pham, Laura Gutierrez Funderburk,
Howell Tan (January 2019)

About The Project



Infrastructure: Project Jupyter

The purpose of Project Jupyter is to develop open-source software with open-standards and services for interactive computing across dozens of programming languages.

Our application uses Python programming language.



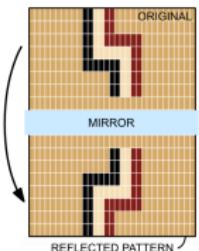
Infrastructure: Syzygy

Syzygy facilitates access to interactive computing notebooks in Julia, Python 2, Python 3 and R programming languages.

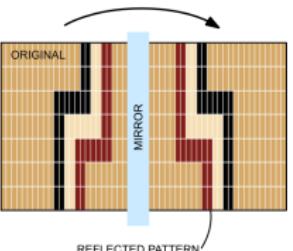
Notebooks can be accessed using institutional as well as Google and Microsoft credentials. Syzygy is hosted by Compute Canada. Callysto notebooks are hosted on servers supported by Cybera.

Geometric Operations

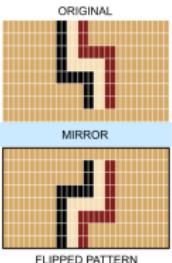
REFLECT HORIZONTALLY



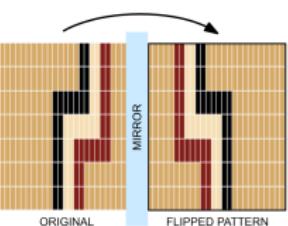
REFLECT VERTICALLY



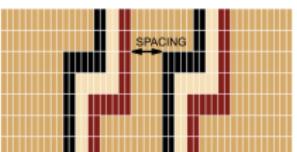
FLIP HORIZONTALLY



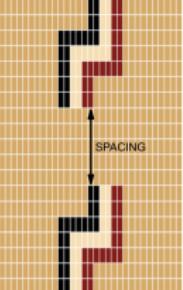
FLIP VERTICALLY



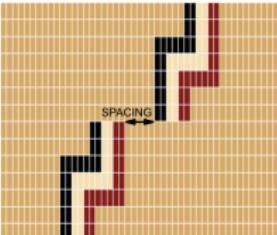
STACK HORIZONTALLY



STACK VERTICALLY



STACK DIAGONALLY



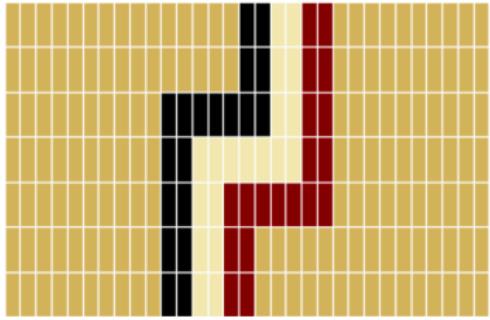
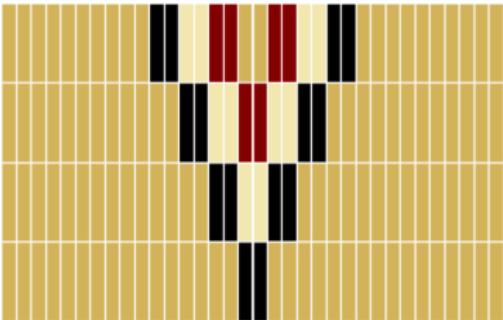
What are the right operations?



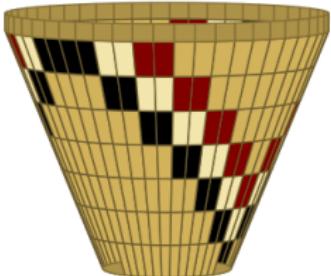
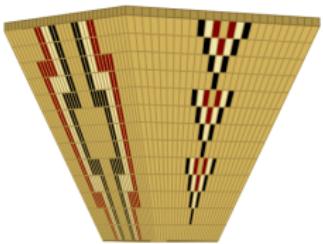
Atomic Motifs

Definition

We define an atomic motif as the smallest unit such that we can recreate an original Tla'amin pattern via applying geometric operations.



End Result



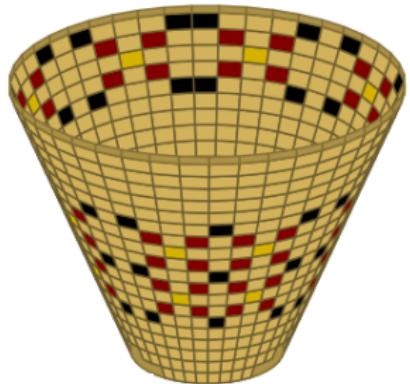
Demo

To access the software, clone the following repository

```
https:  
//github.com/cchauve/Callysto-Salish-Baskets
```

When you open a notebook, press the Kernel menu and choose the *Restart & Run All Cells* option. Confirm you wish to restart and run all cells.

Acknowledgements



Acknowledgements

Thank you to the Tla'amin Nation and members Ms. Betty Wilson, Ms. Gail Blaine, and Mr. Tyler Peters for sharing their knowledge and wisdom on the craft of traditional basket weaving. Many thanks to UBC staff for hosting me and being so welcoming.

Acknowledgements



compute | calcul
canada | canada

Syzygy

Callysto is managed by Cybera and The Pacific Institute for the Mathematical Sciences (PIMS), and funded by Innovation, Science and Economic Development Canada through the CanCode program.

cybera

cybera.ca | @cybera

pims

pims.math.ca | @pimsmath

With funding from | Avec un financement du
Canada

Questions

