A Very Very Long Title for a Presentation about Cats
Mostly Kittens

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ILLINOIS

Outline

Columns

Sometimes things need to be put side by side, in two nice looking columns. Maybe one column involves a quotation.

> Explicit is better than implicit. – The Zen of Python

And, also, perhaps, a logo.

Figure 1: A caption describing the image. [?].

Some Code

I have to use the fragile syntax for code slides. python def meow(volume):
"""Make a demanding noise at the specified volume

Parameters ———— volume: int The volume of the demand. No relation to importance.

Returns ——— str meow """ o = 'o'*volume return 'me'+ o + 'ow'

Outline

1 Introduction

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3 Methods

4 Results

5 Future Work
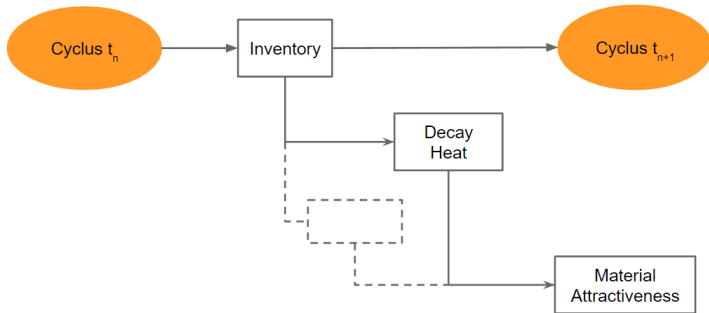
Motivation

What is the goal?

PyRe will be used to answer the following questions

- What is the effect of introducing pyroprocessing plants in the fuel cycle?
- How do various facility designs affect throughput and efficiency?
- Where in a pyroprocessing plant will monitoring most effectively detect material diversion?

The first two can be directly answered by the archetype. The third requires data analysis via diversion algorithms.

Diversion

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Methodology

How does PyRe work?

PyRe does the following with an input
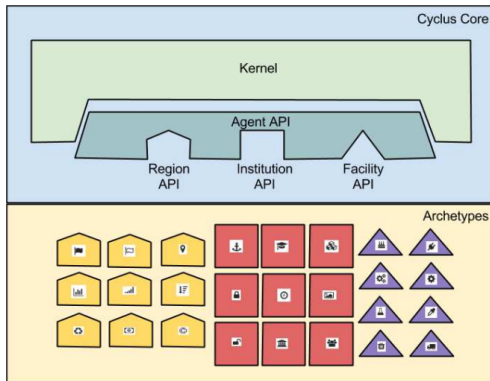stream and facility configuration parameters:

- Pass fuel to voloxidation.
- Generate efficiencies from parameters.
- Multiply stream by efficiency matrix.
- Record stream compositions.
- Repeat for each process.

Cyclus

What is Cyclus?

Cyclus is a modular agent based fuel cycle simulator for tracking commodity transactions between facilities.

Why Cyclus?

Cyclus allows the construction of specific scenarios through the addition of archetypes. These archetypes are modular and the transactions can be tracked.
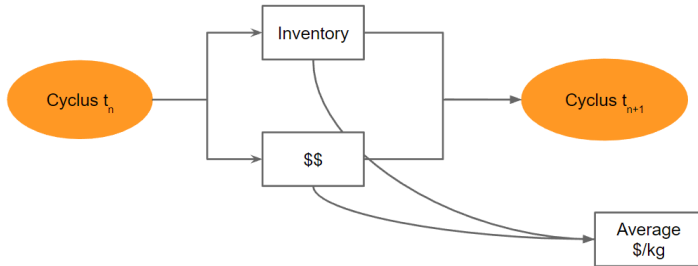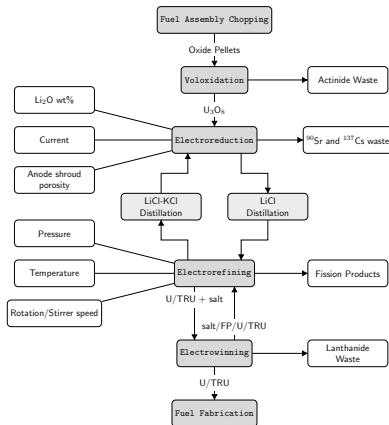

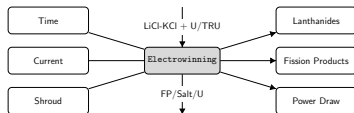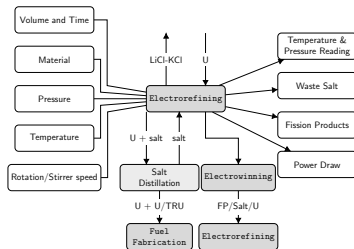Figure 2: Cyclus tracks material flow through the fuel cycle.

Assumptions
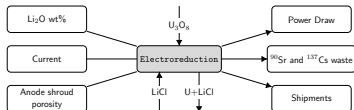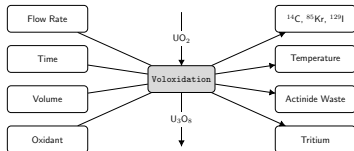
Cyclus Requirements

- Modular.
- Time step $\geq$ 1 month
- Streams must be in a trade-able form.

Fuel Assembly Chopping

Oxide Pellets

Voloxidation → Actinide Waste

U_3O_8

Li_2O wt%

Current

Anode shroud porosity

Electroreduction → ^{90}Sr and ^{137}Cs waste

LiCl-KCl Distillation   LiCl Distillation

Pressure

Temperature

Rotation/Stirrer speed

Electrorefining → Fission Products

U/TRU + salt

salt/FP/U/TRU

Electrowinning → Lanthanide Waste

U/TRU

Fuel Fabrication

Subprocesses

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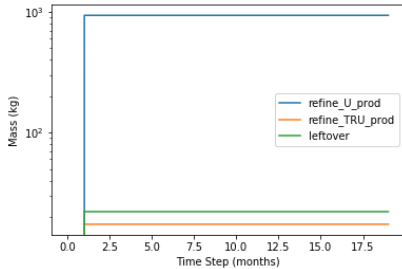
4 Results

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Average Sim

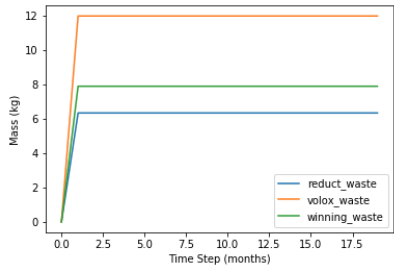

Figure 3: Product time series of a simple simulation.

Figure 4: Waste time series of a simple simulation.

Isotopic Composition of Waste Streams

Figure 5: Isotopic Composition of Average Waste Streams

Current Diversion

Figure 6: Isotopic Composition of Current Diverted Waste Streams

Isotopic Range

Figure 7: Range of Isotopic Values

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Future Work

We have shown that PyRe allows the Cyclus to simulate a simple pyroprocessing scenario future work includes:

- Increase scenario complexity - test shadow diversion
- Improve user input
  - Allow user-defined equations as input
- Chemistry detail

Uses of PyRe:

In the beginning we marked the following objectives:

- What is the effect of introducing pyroprocessing plants in the fuel cycle?
- How do various facility designs affect throughput and efficiency?
- Where in a pyroprocessing plant will monitoring most effectively detect material diversion?

Diversion Algorithm

The first two questions can be answered through the addition of PyRe to Cyclus.
However, to address the last we must employ an algorithm to analyze small
differences between multiple simulations.

Acknowledgement

Acknowledgements should include both people who helped and funding streams.
If you are funded by an NEUP grant, that number usually goes here. .

References I