1. Software integral to Ar/Ar
   1. Data acquisition
      1. Automation
      2. Hardware interface
   2. Data processing
      1. DB
         1. Management of large datasets
      2. Calculations
         1. Efficient
         2. Consistent
         3. Fast
      3. Visualization
         1. Publication ready tables and figures
2. Current Problem
   1. Minor community collaboration
   2. No systematic software validation
   3. Laboratories beholden to few developers
3. Mass Spec
   1. advanced Ar-Ar technique
      1. Used around the world
      2. Streamlined data acquisition and processing
      3. Ability to control large number of hardware components.
   2. Not platform for future
      1. Single developer
      2. “Closed” source
      3. Monolithic
      4. Proprietary platform
      5. Difficult/inefficient to update
         1. No collaboration tools
            1. Changes need to be manually merged/incorporated
            2. No branching mechanism
            3. Version control handled in namespace

Inefficient

Error prone

* + - 1. No testing
         1. Unit
         2. Regression (do updates break previously working functionalities)
    1. No validation
       1. No systematic comparison between other software
    2. No data interoperability
       1. Difficult to import/export data to other formats
    3. No extensive documentation
       1. Legacy PDF user guide
       2. No API or developer guide
    4. No efficient distribution mechanism
    5. Poor handling of legacy data

1. Pychron
   1. Platform for future development
      1. Open source
         1. Transparent isotopic calculations
      2. Written in popular language- python
         1. #1 teaching language at top universities
         2. Widely used in scientific community.
         3. Gaining popularity
         4. Current version 2.7 supported until 2020
            1. New version 3.0 gaining acceptance and popularity
         5. Highly functional
            1. Web programming

Numerous popular frameworks

* + - * 1. Desktop apps

High quality GUI toolkits

* + - * 1. Scripting
        2. “Batteries included”
        3. Thousands of third party packages

Numpy

Scipy

Uncertainties

Sqlalchemy

* + 1. Effective/efficient collaboration and version control via GIT
       1. Hosted at github
       2. Issue tracking
       3. Repository metrics
          1. Traffic
          2. Contributions
       4. Website hosting
       5. Convenient location for discussion
    2. Online documentation
       1. Readthedocs.org
          1. Continuously build

Always up to date

* + - * 1. Exportable as pdf/epub
    1. Unit testing
       1. Validates calculations
       2. Regression testing
       3. Systematic comparison with other software (Mass Spec)