Kirin Patel
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Generation and Sustainability Analysis

- Resource requirements for production
    - For production integration of autoRMZ there are two requirements:
        - A machine which can run the trained model against new spectrographs
            - This would likely be any UNIX based machine (mainly due to the fact that I use a UNIX machine for development)
        - A machine which can be used to continue to train the model should improved results be desired
            - Currently, this machine would have to be capable of running Kubeflow Pipelines, however, the code can be translated to be run outside of Kubeflow Pipelines
- Availability of resources
    - Kubernetes and Kubeflow Pipelines are open sources tools, they are available via Github
    - autoRMZ is also open sourced and available via github
    - A computer required to run the trained model on should be readily available as BRAMS already collects and processes data at some or all of its stations
        - Should one not be available a raspberry pi will suffice, it is a cheap and easy to use computer
- Scalability and Economic viability
    - autoRMZ was not designed with scalability in mind, this solution is custom built with the intentions of only being deployed for BRAMS. However, even with this consideration, the foundation of Kubeflow Pipelines allows any implementer the ability to train with differing datasets and requirements with ease.
    - autoRMZ currently has a net development and implementation cost of $0, but this is only within the context that I have access to a GCP Kubernetes cluster and that a machine that can run the trained model against new spectrographs is readily available.
        - This may not be the case and can result in a monthly bill due to GCP usage and a one time cost for a machine to run the model.
            - This machine can be a raspberry pi.
- End-user training
    - End-user training will not be heavily prioritied. This is due to two factors, heavy documentation/blog posts and the intended area of use. Since this project will be documented heavily via comments, blog posts, and other methods, the code itself is intended to provide all references and information that a developer looking to extend functionality within it. As for BRAMS, it would be ideal to have a single command line program with a man script that can easily explain how to

interact with the trained model to obtain data about where meteors exist within spectrographs. The application would not need much training because of this.

- Product assessment strategies
    - Assessment strategies surround the development and implementation of the machine learning model. The ease of training alongside the ease of deployment and usage of the model should be used when assessing the successfulness of this project.
- Measurement tools and criteria for evaluating the product
    - Criteria that should be used when evaluating the training portion of this project should evaluate the time it takes to conduct training as well as the effectiveness of the training.
        - Metrics for effectiveness of training are currently not known. These need to be investigated and determined during model creation.
    - Criteria that should be used when evaluating the deployment and usage portion of this project should evaluate how easy it is for someone who is unfamiliar with the project to understand the man page and execute commands.
        - A deep understanding of how to use this system should not be required in order for a user to execute commands.
- Decision criteria for product assessment
    - Once metrics for effective training are determined, should those metrics not be met, a strategy for improving model training should be determined and written out for future implementation.
    - For the deployment and usage portions of the model, should the fail to meet the standards specified, the application should undergo review to determine where and why these standards are not met. At the bare minimum, a plan for action needs to be determined and written out so that future work can be done easily to remedy these issues.
- Other factors originated by the student
    - This analysis has been conducted before model training and deployment has occurred. These should be considered to be in a fluid state that may change as additional information is obtained during training and deployment.