# RFP Themes

The following are some ideas for themes for the RFPs. The assumption is that these will be “calls for proposals” along these topics where we will give special preference to proposals that address the themes. But we would continue to take proposals on any topic at all times.

1. Community Research Data and Services. We are interested in receiving proposals for cloud research projects that can support community access to general or discipline specific research data collections and the associated analysis and curation services. We anticipate making a number of awards in this category.
2. Streaming instrument data to the cloud. Scientific instruments are currently generating large volumes of data that can be streamed to Windows Azure where they can be collated and processed in realtime and important patterns can be recognized. We are interested in proposals that will use any available complex event process system on Azure to study scientific instrument data.
3. Machine Learning in the Cloud. Machine Learning is now an integral part of many scientific big data analysis project. We are interested in proposals that will build scalable machine learning platforms for scientific applications on Windows Azure. These may be based on open source platforms like scikit learn or other available Microsoft machine learning tools.
4. Large scale image analysis. The Windows Azure cloud is an excellent place to do analysis of large collections of scientific research images from domains like medical scans, astronomy data, geoscience data. We are interested in projects interested in hosting scientific image collections and building and supporting on-line analysis tools. Image analysis algorithm competitions are also of interest.
5. Environmental Science in the cloud. We have a number of interesting environmental science applications already running on the Windows Azure cloud. These include watershed analysis, MODIS satellite image analysis and oceanographic modeling. We are interested in proposals that build on our existing collection of MODIS data with new analysis tools or applications that use our FetchClimate, dataup or layerscape app for environmental studies.
6. Hosting Astronomy in the cloud. Tools such as Microsoft’s World-Wide telescope have introduced astonomy to a very wide community of both professional and amateur scientists. More can and must be done to take advantage of the cloud to provide access to the next generation of astronomical instruments. Other open source tools from the research community are now available as virtual machine images for Windows Azure. We welcome all proposals that can advance the state of the art in astronomy research using the Windows Azure cloud.
7. Genomics in the cloud. Many bioinformatics projects are well suited to cloud computing. It is possible to host large genomic data collections and the standard tools such as bioLinux and Galaxy are available for Windows Azure. We welcome proposals we welcome proposals to use these and other open source and Microsoft tools to advance the field of bioinformatics on windows Azure.
8. Urban Science. Modern cities are facing many complex problems including economic development, transportation management and carbon footprint. Data is now widely available from city sources that can provide realtime and historic views of the city. We can now use facilities like Windows Azure to aggregate and analyze this data to build smarter cities. We welcome proposals that wish to use the cloud to be city data resources that can the citizens build better urban environments.
9. Large scale graph analysis. The research that is emerging from the study of social networks is changing social sciences. Similar advances are being made in the study of science itself. What ideas are influenced by what experiments and past research? Where are the trends of science going? These questions can be partially answered by the study of the links between research publications. Much of this work depends upon large scale analysis of large graphs and facilities like Windows Azure are well suited for this work because of its capacity to store and analyze large distributed collections of data. Project proposals that address this topic are encouraged to apply.
10. Mobile cloud applications. We all use mobile apps that are connected to large cloud services. The software architecture of these client+cloud applications is not well understood. For example, how much of the computation belongs on the client device and how much must go on in the cloud? How do you scale a cloud service to efficiently support a million active users? This topic is a black art rather than science. We welcome proposals that can address this computer systems problem by using Windows Azure.