How the Top 25 Universities use Information Technology and Services to Support Research

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President Gilley has challenged us to take The University of Tennessee into the ranks of the Top 25 universities, especially in the area of research. This report examines how a sample of 11 of the Top 25 use Information Technology (IT) and Services to support their research efforts. This sample includes the institution ranked number one, UC Berkeley, the institution reputed to have the largest IT budget, the University of Michigan, the UT official peer institutions that are in the Top 25, and three others that were chosen at random from among the top large public research universities. To see how UT's support compared to the support offered by the larger Tennessee Board of Regents schools, The University of Memphis and Middle Tennessee State University were added because they are the two largest. The web pages of the chosen universities were extensively searched to find units that offered free support on the topics listed below. Email and phone calls were used to follow up when a given school's web pages were not sufficiently clear on their level of support. The topics were:

- Statistical consulting and computing
- Mathematical consulting and computing
- Programming languages such as FORTRAN, C…
- High Performance Computing (HPC)
- Visualization
- Geographic Information Systems (GIS) including Global Positioning Systems
- Text analysis
- Image analysis, especially quantitation

Executive Summary

UT compares well to the Top 25 only in the availability of hardware and software. All of the Top 25 universities surveyed offer their researchers far more extensive support services, see Table 1. The Board of Regents universities also offer their researchers support in mathematics and programming languages that UT stopped supporting due to the budget cut of 1996.

To reach its goal of joining the Top 25, UT needs to add support services in the areas of statistics, mathematics and geographic information systems. The areas of text and image analysis are less widely supported. However, since they are high growth areas, we should monitor them carefully to determine when they reach critical mass. Programming language support that is not affiliated with statistics, mathematics or high performance computing was found so rarely that we should not consider renewing support for that area unless its usage increases. The needed improvements in these areas will require the addition of 7.5 FTEs for an annual cost of $537,000.

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Manager, UC Computer Store, Dr. Robert Mee, Head, Department of Statistics, Mr. Jim Minton, Map Librarian, Dr. Bruce Ralston, Head, Department of Geography, Dr. Arnold Saxton, Professor, Department of Animal Science and Statistician from the recently disbanded Agricultural Statistical and Computing Services unit, Dr. James Schmidhammer, Professor, Department of Statistics, Dr. Grant Somes, Professor and Chair, Department of Preventive Medicine at the UT Health Science Center.

Table 1. Sources of free support for research computing at the sampled top 25 universities. Numbers indicate how many centrally available units offer training and/or consulting support for that particular area. FTEs or dollars spent per researcher would have been much better measures, but such information is difficult to collect even for UT. Units that support only a single department are not included. The precise school names and more detailed results are listed in the *University Specific Results* section.

Rank, Institution, UT Peer	Statistical Consulting and Computing	Mathematical Consulting and Computing	Programming	High Performance Computing	Visualization	GIS	Text Analysis	Image Analysis
1. Berkeley	4	0	0	1	1	1	0	0
2. Virginia, UT Peer	5	1	0	1	2	1	0	1
3. Michigan	2	1	0	1	1	1	0	0
5. UNC, UT Peer	5	1	0	1	1	3	1	0
10. Penn State	3	1	0	1	1	1	0	0
13. Texas, UT Peer	1	1	1	1	1	0	0	0
13. Washington	6	0	0	0	2	1	1	1
16. Florida, UT Peer	3	1	0	2	2	1	0	0
21. Iowa	2	0	0	1	2	1	0	1
22. Georgia, UT Peer	4	0	0	1	1	1	0	0
22. Maryland, UT Peer	2	2	0	1	1	1	1	0
43. UT	**1[1]**	**0**	**0**	**1**	**1[2]**	**0[3]**	**0**	**0**
U of Memphis	1	1	0	0	0	0	0	0
MTSU	1	0	1	0	0	0	0	0
Percent of Top 25 Supporting	**100%**	**64%**	**9%**	**91%**	**100%**	**91%**	**27%**	**27%**

[1] One at Knoxville and one at Memphis whose efforts are not generally available at the other location. Agricultural statistical consulting unit recently disbanded.

[2] JICS provides free support but when high performance computing is required. The Advanced Visualization Laboratory has no full-time staff and hires support staff only when funding becomes available.

[3] The services that are available are so limited that they are not advertised.

Results

Hardware and Software

Comprehensive computing hardware and software to support these areas is available at all the universities, with the exception of High Performance Computing (HPC) hardware. While 73% of the Top 25 have on-site supercomputers, Berkeley and UNC use the systems at their state-wide centers. Washington is the only one that offers no HPC support of any kind (verified via personal communication.)

Overall, the hardware and software offered by the Top 25 are only marginally more comprehensive than the selection offered at UT.

Support

The main difference found between the Top 25 universities and UT is that all place a much higher priority on providing free, widely available, IT-related research support services. The level of free support offered is often limited by time or number of visits (see the *University Specific Results* section for details). If we hope to join their ranks we must reconsider our priorities and begin building a much stronger research-support infrastructure. *The remainder of this report focuses on support issues*.

Statistical Consulting and Computing

Statistical support is offered at all of the Top 25 and both of the Board of Regents schools surveyed. Given that an estimated 55% of all research projects at UT use statistics, that is not surprising. What is surprising is that the level of support found at the Top 25 was *far* more extensive than we offer at UT. As you can see from Table 1, it was common for four or five different units to offer statistical support, each specializing in areas like survey research or Biostatistics. Ninety one percent (all but one) of the Top 25 use a combination of their main IT Center and the Statistics Department as the support unit(s), open to all researchers.

UT's Knoxville campus currently offers statistical support by offering 10 hours of free support per researcher per semester. Five FTEs provide support for statistics, graphics, basic mapping (not GIS), data mining and data visualization as well as managing the fee-based services of software licensing and optical test scoring. This covers around 85% of the statistical problems that researchers need solved on campus. Around 50 research projects per year cannot be supported due to lack of resources. Prior to the 1996 budget cut, these projects were supported by a quarter-time Faculty Associate with the Department of Statistics and two graduate assistant positions. The Faculty Associate also recruited assistance from many different members of the Department of Statistics when their areas of expertise were needed. Those problems now go unresolved.

Until June 2000, agricultural statistical analysis was supported by the Statistical and Computing Services unit on that campus. That unit was disbanded on June 1, 2000 when three statisticians were hired away from UT, and this resulted in the loss of one FTE of free statistical support. Now support for agricultural studies is limited to one meeting with Dr. Arnold Saxton, followed up with support from ORIT staff.

It is difficult to imagine how UT will move forward in the rankings while moving backwards in such widely used research support services.

At UT's Memphis campus, six statisticians in the Department of Preventive Medicine offer biostatistics and epidemiology support. They consult with faculty, staff and students and are involved with a great deal of research as co-investigators. They charge for consulting, but not for proposal development if they are listed as co-investigators. They are willing to extend this resource statewide to the other campuses. The video conferencing facilities that we are already working to establish among the campuses should make this type of university-wide support more feasible.

Recommendations for Statistical Consulting and Computing

Fund one full-time position to be shared between the Office of Research and Information Technology (ORIT) and the Department of Statistics and another for the Agriculture Campus. The Department of Statistics position would provide much greater depth of support than we are currently able to offer, plus create an environment in which all Statistics Department faculty are encouraged to contribute their expertise in exchange for this new position doing some teaching. The Agriculture position would restore the focused expertise needed for experimental designs that are common in their fields but which are rarely used in others.

The estimated yearly cost of two FTEs: $173,000 (($80K salary + $6,500 expenses) x 2)

We are currently planning to make the most of our statewide statistical resources by using videoconferencing to connect statistical support units at Knoxville and Memphis. Once the networking issues are resolved, we need to solve billing issues. For example, statistical support for faculty and staff researchers on the Knoxville campus is funded from the Knoxville budget and currently applies only there. We expect that unmet demand from the other campuses is a small and manageable percent, but still the decision must be made to apply the budget to them, and procedures must be developed to do billing when the 10 centrally-funded hours run out.

Student researchers face a similar situation. Knoxville student researchers are funded via the technology fee, leaving us no clear way to support student researchers at the other campuses. The Knoxville consultants used to routinely help students at other locations, Chattanooga in particular, but that assistance was eliminated in the budget cut of 1996.

Extending the budget for faculty and staff researchers from Knoxville to other locations is a relatively easy problem to solve compared to unifying the different Technology Fees.

Mathematics/High Performance Computing/Visualization/Programming

Although these four areas were investigated separately, it turned out that support for them is usually offered by a single campus unit.

High Performance Computing was supported by 91% of the Top 25 universities, all but the University of Washington. At UT, support for HPC, programming and visualization is offered via the Office of Research and Information Technologies' Scientific/Research Computing Division. This unit assists researchers on the coding of individual applications and recommends target

architecture(s), parallelizing tools, visualization and graphics interfaces, and homogeneous or heterogeneous parallel implementations.

However, if a researcher's problem requires mathematical, visualization and/or related programming assistance which does *not* require High Performance Computing, he or she has nowhere to turn for support. For example, the popular area of symbolic mathematical computing, which uses tools such as Mathematica and Maple, rarely needs high performance computing.

Visualization is supported at all of the Top 25 and all but two of them are supported through the high performance computing support group. Scientific visualization is also often paired with mathematics support. As mentioned above, visualization is supported at UT by the Scientific/Research Computing Division, but only when high performance computing is required. UT's Applied Visualization Laboratory is another resource, but it has no full-time staff and can hire support staff only when grants are received. Of course getting those grants is difficult without any support up front.

Applied mathematics and mathematical computing is supported at 64% of the Top 25. This is usually in combination with MATLAB and either Maple or Mathematica. It is less often combined with IMSL and NAG routines called from general purpose languages such as FORTRAN and C. Given the mathematical nature of high performance computing, support may be available through those support staff, but it is not advertised as such. The University of Memphis also supports mathematical computing using Mathematica.

Dr. Louis Gross, the Professor of Ecology and Evolutionary Biology who helped arrange the Maple site license reports frequent requests for assistance that he cannot handle. HelpDesk calls on the topic currently go unresolved. The volume of mathematical software sold at the UC Computer Store and by DII's Contract and License Administration team was second only to statistical software (350 copies/year for math, 1,000/year for statistics).

Before the 1996 budget cuts, DII supported the non-high-performance aspects of applied mathematics and mathematical computing with 4.25 FTEs, which includes a quarter-time Faculty Associate position with the Department of Mathematics. Today, there are no positions supporting these popular areas. Again, it will be difficult moving forward in the rankings after moving so far backwards in support.

General-purpose programming languages are almost never (9%, or one school) supported by the Top 25 outside of statistical, mathematical or high performance computing. Interestingly, MTSU does offer general programming language support for academic projects.

Recommendations for Mathematics/HPC/Visualization/Programming

The Knoxville campus lacks support for three of these four areas, except when high performance computing is involved; mathematics, visualization and general programming go unsupported. The low level of support offered by the Top 25 for general programming indicates that it should be a low priority compared to the other areas. We should begin to support applied mathematics, mathematical computing and visualization by hiring one full-time consultant and two half-time GAs for ORIT's Scientific/Research Computing Division. The position description should emphasize our weakest area: symbolic mathematical software. It is likely that a person could be found who would also have expertise in high performance computing and visualization, which would make him or her a good blend for that group. UT should also fund one full-time position to be shared between the Office of Research and Information Technology and the Department of

Mathematics. This position would provide much greater depth of applied mathematics and mathematical computing support, plus create an environment in which all of the Department's faculty are encouraged to contribute their expertise when needed in exchange for this new position doing some teaching.

Training for software such as Mathematica, Maple, MATLAB, TEX and PVwave should be integrated into DII's Training and Documentation team online registration and support questions should be tracked via DII's HelpDesk using the planned Remedy system.

Estimated yearly cost of 3 FTEs: $190,000 ($80K Math, $65K ORIT + 2x$6,500 support + $15Kx2 GAs + $2,000 expenses)

Geographic Information Systems

All of the Top 25 offered centralized support for geographic information systems except for the University of Texas at Austin. Their GIS efforts were focused exclusively on water distribution. A consulting unit not affiliated with the central IT group offers GIS support at 45% of the Top 25, and the library supports it at 36%. Only one, Michigan, offers support via its statistical consulting unit and two, UNC and UGA, offer support via its IT unit. Neither of the two Board of Regents universities offered centralized GIS support.

Two graduate assistants provide a minimal level of GIS support at the UT Knoxville campus. Funded by the Science Alliance, and housed in the Department of Geography, their services are not advertised and so are not widely known of. Prior to the 1996 layoff, DII provided one FTE to support this and other areas that GIS has since absorbed, such as topographic surface fitting.

Recommendations for GIS

Begin to provide comprehensive support in this area by funding a full-time position in ORIT whose main purpose is to offer free support in the form of consulting (10/hour/semester limit) and teaching short non-credit training seminars in GIS tools such as ArcView and Arc/Info. Also hire a half-time GA position to cover during times of leave. Finally, fund one full-time position to share between ORIT and the Department of Geography. This position would provide a greater depth of support, plus create an environment in which all Geography faculty members are encouraged to contribute their expertise in exchange for this new position doing some teaching.

The consulting should be integrated into the planned HelpDesk Remedy referral system and the training should be similarly integrated into the DII Technology Training Team's current online training registration system.

Estimated yearly cost of 2.5 FTEs: $174,000 ($80K Geography + $65K DII + 2x$6,500 expenses + $15K GA + $1,000 GA expenses)

To prevent overlap of services between the new support of GIS and the existing support of statistical mapping, DII's statistical consultants should limit their efforts to mapping in the context of analysis rather than extending into full GIS support. Conversely, when GIS support receives a request for statistical analysis that goes beyond basic descriptive displays they should refer the client to the statistical consultants. Finally, the Agricultural Statistician should handle

spatial statistical analyses that are common to GPS-controlled micro farming, but also applicable to other areas such as semiconductor wafer testing.

Text Analysis

Text analysis programs are a relatively new type of software. They are also called qualitative analysis packages, although that term has many different meanings in different fields. There are dozens of packages that perform some type of text analysis but no clear software leader. This area ranges from software that assists the researcher in manual categorization and theory development (e.g. QSR NUD*IST) to software that automates the categorization process and quantifies the categories for statistical hypothesis testing (e.g. TextSmart). UT has an estimated 50 researchers using text analysis software.

All of the Top 25 use this type of software, but only 27% offer centralized support for training and use. Neither the Board of Regents schools offer support for this area.

Recommendations for Text Analysis

Although it appears to be a low priority today, the area is quickly changing and should be monitored until demand reaches a critical mass.

Image Analysis

Image analysis has many different meanings. The focus in this study is on image *quantitation*, which uses computer software to turn the image in to numerical quantities, which are then usually used as input to a statistical analysis. Departments at UT using image quantitation include biology, for counting cells, ecology, for measuring total area and percent plant or desert coverage, forestry, for calculating the amount of sun a wooded plot receives and mechanical engineering, for measuring the mechanical elongation of cells under a pressurized laminar flow. The number of UT researchers using such software is difficult to estimate since much of it is available from the public domain.

All of the Top 25 use image quantitation software, but only 27% offer centralized support for training and use. Neither the Board of Regents schools offer support for this area.

Recommendations for Image Analysis

Although it appears to be a low priority today, the area is quickly changing and should be monitored until demand reaches a critical mass.

Conclusion

The total cost of the above recommended improvements to research support is $537,000 per year for 7.5 FTEs. These changes are a relatively small but significant step toward bringing UT up to the level of the Top 25.

Hopefully this increase in support will lead to an increase in grant funding that would allow UT to develop the far more in-depth, area-specific support that is an intrinsic part of the top tier of research universities.

University Specific Results

University of California, Berkeley – ranked #1

Statistical Consulting and Computing
- Statistics Department's Statistical Consulting Service offers free consulting support. They also offer central computer accounts to all researchers on a SparcCenter 2000 and a computer lab of 40 Sun workstations and 60 X-windows terminals
- Survey Research Center offers hardware, software and consulting services for survey design, data collection including Computer Assisted Telephone Interviewing, and analysis. While some free consulting is offered as a professional courtesy, most services are billed.
- Econometrics Laboratory offers hardware, software and extensive training and documentation in statistical methods, but no consulting support
- Social Science Computing Laboratory offers statistical support for the social sciences.

Mathematical Consulting and Computing
The Statistical Computing Facility makes mathematics software available at UC Berkeley. No centralized support was found for mathematical consulting.

Programming Languages
The Statistical Computing Facility makes compilers available at UC Berkeley. It is unclear how much support for non-statistical and non-high-performance programming is available.

High performance computing
The UC system has state-of-the-art high performance computing support available through their San Diego campus.

Visualization
The main support for visualization is though the San Diego campus.

GIS
Supported by the Geographic Information Science Center. This unit supports all aspects of GIS campus-wide and reports to the Vice Provost. It has a HelpDesk devoted to the subject, which is open 3 days a week, two hours per day. They offer non-credit short courses on GIS.

Text Analysis
No centralized support was found.

Image analysis
No centralized support was found.

University of Virginia – ranked #2 and an official UT peer

Statistical Consulting and Computing
- Research Computing Services division of Information Technology and Communication offers complete consulting services for statistical computing and methodology. However, they prefer that the client choose methodology with advice from the client's department and/or the Statistical Consulting Service described in the bullet immediately below.
- Division of Statistics, Department of Mathematics offers free advice and charges $95/$45 (Prof/GA) an hour to do the analysis. They exclude all class projects. During the summer, even faculty advice is $95/hour.
- The Division of Biostatistics and Epidemiology in the Health Sciences Center provides "high priority free assistance in developing grant proposals…including designing studies, developing analytic plans and analyzing pilot data." The unstated implication here is that once grants are awarded, billing will begin.
- Academic Computing Health Sciences division provides assistance with statistical computing and analysis.
- The Geospatial and Statistical Data Center, located in the Library helps researchers locate data and shows them how to do basic statistical analyses.

Mathematical Consulting and Computing
Research Computing Services supports mathematical computing but training is only offered on SAS and SPSS.

Programming languages
Support is offered only for high performance computing and mathematical programming.

High performance computing
The Research Computing Services offers extensive collections of hardware, including an SP2, software and support for all the areas below except for GIS. Research computing training is limited to SAS and SPSS.

Visualization
- The Research Computing Services offers support of visualization.
- The Academic Computing Health Sciences division supports data visualization, image scanning, analysis, filtering and quantitation (converting images to numbers for statistical analysis).

Geographic Information Systems
The Geospatial and Statistical Data Center is located in the library. Although they specialize in data rather than analysis, they do show people how to create basic maps using ArcView or to run basic analyses in SPSS. Staff consists of 7.5 FTE, 5 of which are full-time.

Text Analysis
No centralized support was found.

Image analysis
The Academic Computing Health Services department offers free support of the widely applicable Image Pro as well as the biology-specific ImageQuant and Bioimage.

University of Michigan – ranked #3

Statistical Consulting and Computing
- Center for Statistical Consultation and Research, in the Office of the VP for Research has 10 FTEs (half of them PhDs) and 8 faculty associates. Their comprehensive service is free and they offer evening hours 7-9pm Monday through Thursday and unlimited walk-in hours.
- Information Technology Division Statistics Service offers assistance with statistical computing and teaches extensive 20-hour non-credit courses in SAS and SPSS.

Mathematical Consulting and Computing
The Mathematics Department has a Computing Support Group that supports mathematics.

Programming languages
No centralized support was found.

High performance computing
The Center for Parallel computing supports both high performance computing and visualization with a staff of 6 FTE.

Visualization
The Center for Parallel computing supports both high performance computing and visualization with a staff of 6 FTE.

Geographic Information Systems
Supported by the Center for Statistical Consultation and Research, which teaches workshops in GIS and is developing expertise in spatial analysis, which is statistical techniques applied to spatial problems.

Text Analysis
No centralized support was found.

Image analysis
No centralized support was found.

University of North Carolina, Chapel Hill – ranked #5 and an official UT peer

Statistical Consulting and Computing
- Academic Technology & Networks provides support for statistical computing including training seminars.
- Odum Institute for Research in the Social Sciences offers full statistical consulting for researchers in the social sciences, including training seminars. This unit also offers a repository for datasets such as the ICPSR. They also support text analysis.
- Biostatistics Department offers statistical consulting on biological research for free on low-priority projects. Paying clients receive high priority.
- Survey Research Unit offers assistance in the design and analysis of surveys.
- L.L. Thurstone Psychometric Laboratory provides statistical support mainly for psychological research but also offers help to researchers in other areas

Mathematical Consulting and Computing
Academic Technology & Networks provides support for Mathematica.

Programming languages
No centralized support was found outside of high performance computing.

High performance computing
Hardware, software and consulting support are provided at no cost to researchers through the North Carolina Supercomputer Center. They pay $8.5 million per year for this access.

Visualization
Hardware, software and consulting support are provided at no cost to researchers through the North Carolina Supercomputer Center.

Geographic Information Systems
- Academic Technology & Networks' GIS Support Group provides support for GIS through consulting and training in ArcView and Arc-Info.
- Carolina Population Center's Spatial Analysis Unit offers full support for GIS.
- Davis Library's reference section teaches short courses on ArcView and MapInfo. They prepare map data and statistical datasets for use and help researchers locate the ones they need.

Text Analysis
The Odum Institute for Research in Social Science offers non-credit training seminars and free consulting support for Ethnograph, askSam, NUD*IST, Textpack PC and Atlas/ti.

Image analysis
No centralized support was found.

Pennsylvania State University – ranked #10

Statistical Consulting and Computing
- Center for Academic Computing's Numerically Intensive Group supports statistical computing, as well as mathematical computing, high performance computing, visualization and programming languages. They offer an extensive array of training seminars on all these topics.
- Statistical Consulting Center is in the Department of Statistics and is staffed by 9 FTE, 6 faculty associates and have 7 professors serving on their advisory committee. All graduate students receive 2 free sessions
- The Statistics Core of the Population Research Institute offers complete statistical consulting services for researchers in demography.

Mathematical Consulting and Computing
Center for Academic Computing's Numerically Intensive Group supports statistical computing, as well as mathematical computing, high performance computing, visualization and programming languages. They offer an extensive array of training seminars on all these topics.

Programming
Supported in relation to numerical analysis.

High performance computing
Center for Academic Computing's Numerically Intensive Group supports statistical computing, as well as mathematical computing, high performance computing, visualization and programming languages. They offer an extensive array of training seminars on all these topics.

Visualization
Center for Academic Computing's Numerically Intensive Group supports statistical computing, as well as mathematical computing, high performance computing, visualization and programming languages. They offer an extensive array of training seminars on all these topics.

Geographic Information Systems
The Peter R. Gould Center for Geography Education and Outreach provides support for GIS projects and emphasizes the use of student interns to enhance their education as well. They teach an Introduction to ArcView each month.

Text Analysis
No centralized support was found.

Image analysis
No centralized support was found.

University of Texas, Austin – tied for rank #13 and considered a UT peer institution

Statistical Consulting and Computing
Academic Computing and Information Technology Services' Statistical Services offers an unlimited amount of free support but only 30 minutes at a time, emphasizing basic questions. Contracts are required for contiguous consulting. It offers training in popular statistical packages. They have 3.25 FTE.

Mathematical Consulting and Computing
Academic Computing and Information Technology Services' Mathematical Services group supports a broad range of computational mathematics, excluding statistics. They also support programming languages and visualization packages.

Programming languages
Academic Computing and Information Technology Services' Mathematical Services group supports a broad range of computational mathematics, excluding statistics. They also support programming languages and visualization packages.

High performance computing
Academic Computing and Information Technology Services' Texas Advanced Computing Center provides complete high performance computing support including training, consulting, programming and visualization.

Visualization
Academic Computing and Information Technology Services' Mathematical Services group supports a broad range of computational mathematics, excluding statistics. They also support programming languages and visualization packages. Also, Academic Computing and Information Technology Services' Texas Advanced Computing Center provides complete high performance computing support including training, consulting, programming and visualization.

Geographic Information Systems
Although around 3,000 web references to GIS projects were listed at the University of Texas web site, no central area of support was found.

Text Analysis
No central support was found. The School of Nursing does offer training and consulting support for Ethnograph, Hyperresearch, Genca and NUD*IST, but it is limited to members of their department.

Image analysis
No centralized support was found.

University of Washington – tied for rank #13

Statistical Consulting and Computing
- Computing & Communications' Statistical Package Consulting Office has 3 FTEs which provide statistical computing advice but refer questions of methodology to the other units.
- Center for Statistical Consulting is a joint effort of the departments of Statistics and Biostatistics. Their advice is free but hands-on analysis is done for a fee.
- Quantitative Ecology and Resource Management offers free statistical consulting to Fisheries, Urban Horticulture, Stream-side Studies…
- Center for Statistics and the Social Sciences offers statistical and computational support for free but only to researchers in the social sciences.
- The Center for Social Science Computation and Research supports research computing in eleven social science departments including geography and economics. They teach short courses on SPSS, ArcView and text analysis using Atlas/Ti.
- Behavioral Sciences Core's Statistical Consulting Services offers services to researchers only in the area of Human Development and Disability

Mathematical Consulting and Computing
The Math Sciences Computing Center supports mathematical computing only for students taking specific classes.

Programming languages
No support for general programming languages was found at UW.

High performance computing
No support for high performance computing is available at UW (verified via email).

Visualization
The Computing and Communications' Visualization Lab has consultants to assist with both hardware and software. The Locke Computer Center also offers support for visualization software such as the Application Visualization System, AVS and 3D Studio Max.

Geographic Information Systems
Support is offered only on ESRI products and only for specific operational questions via email. Training is offered only through for-credit courses.

Text Analysis
The Center for Social Science Computation and Research provides consulting support for Folio Views, NUD*IST, Ethnograph, QCA, Storyspace and Textpack.

Image analysis
The Locke Computer Center offers free support of NIH Image, ImageQuant and Data Thief.

University of Florida – ranked #16

Statistical Consulting and Computing
- The Center for Instructional and Research Computing Activities has a Statistical Consulting Center, but its web page is offline for revision. They also have a SAS Support Group and SPSS Support Group that support only departmental support personnel.
- The Department of Statistics' Division of Biostatistics has the Biostatistics Consulting Laboratory that offers full statistical consulting services.
- The Institute of Food and Agricultural Science's Statistical Consulting Unit has 3 FTEs supporting faculty, staff and graduate student researchers in their area only.

Mathematical Consulting and Computing
The Center for Applied Mathematics provides support for all departments.

Programming languages
None was found outside of high performance computing.

High performance computing
- Available through the Northeast Regional Data Center with extensive hardware, software and consulting support.
- The Brain Institute of U of FL also offers hardware and software for high performance computing.

Visualization
- Available through the Northeast Regional Data Center with extensive hardware, software and consulting support.
- The Brain Institute of U of FL also offers hardware and software for high performance computing.

Geographic Information Systems
The Geo-Facilities Planning and Information Research Center has extensive facilities for GIS work. They handle a wide range of contract work but it is not clear how much support they offer to unfunded projects.

Text Analysis
No centralized support was found.

Image analysis
No centralized support was found.

University of Iowa – ranked #21

Statistical Consulting and Computing
- Statistical Consulting Center in the Department of Statistics and Actuarial Science has one manager, two GA's and access to all faculty members when needed. It offers unfunded researchers 10 hours of free support per semester, just as we do. Funded research is $70/$50/hour (fulltime/GA) for internal projects (ours is $60) and $140/$100/hour for external projects.
- Information Technology Services supports only statistical computing, but teaches seminars in complex statistical computing such as multivariate analysis.

Mathematical Consulting and Computing
The Division of Mathematical Sciences' Computer Support Group offers an extensive selection of mathematical software but states unequivocally that they do not offer assistance to researchers in its use.

Programming languages
Information Technology Services' Advanced Research Computing Services provides support for high performance computing, programming and visualization. Five FTE staff the facility. Consulting is offered one consultant at a time, two hours per day.

High performance computing
Information Technology Services' Advanced Research Computing Services provides support for high performance computing, programming and visualization. Five FTE staff the facility. Consulting is offered one consultant at a time, two hours per day.

Visualization
Information Technology Services' Advanced Research Computing Services provides support for high performance computing, programming and visualization. Five FTE staff the facility. Consulting is offered one consultant at a time, two hours per day. The Biotechnology Byproducts Consortium also provides support to the biological sciences for visualization in their Image Analysis Facility.

Geographic Information Systems
The Library offers the only GIS facility available to any researcher. Many departments have their own facilities. There seems to be no support beyond the librarian helping to find maps and data.

Text Analysis
No centralized support was found.

Image analysis
The Biotechnology Byproducts Consortium provides support to the biological sciences for visualization in their Image Analysis Facility.

University of Georgia – tied for rank #22 and considered a peer of UT

Statistical Consulting and Computing
- University Computing and Network Services' Statistical Support Group provides assistance with installation, training, programming, use of statistical software, but not methodology.
- Statistical Consulting Center has one director and three GA's and offers one free hour of support.
- Statistical Consulting via Course provides free advice by students taking a class in statistical consulting, which is supervised by a professor.
- College of Veterinary Medicine offers free statistical consulting for their researchers.

Mathematical Consulting and Computing
Support for mathematics and mathematical computing was not found at UGA.

Programming languages
Supported through the Research Computing Resource's high performance computing resources.

High performance computing
The Research Computing Resource offers support not only in high performance computing, but also has experts in biological sciences computing, molecular graphics, computational chemistry and computational physics.

Visualization
Supported through the Research Computing Resource's high performance computing resources.

Geographic Information Systems
Information Technology Outreach Services offers extensive support for GIS. Although fees are not described, services are offered to "organizations" implying that individuals are not supported without fees.

Text Analysis
No centralized support was found.

Image analysis
No centralized support was found.

University of Maryland, College Park – tied for ranked #22 and considered a peer of UT

Statistical Consulting and Computing
- The Office of Academic Computing Services provides statistical consulting by one PhD and provides SAS and SPSS training by others.
- Statistics Laboratory is a joint effort of Academic Information Technology Services and the Statistics Program in the Mathematics Department provides consulting for statistics and computing. Short-term training is free. It is the only unit that provides test-scanning services as we do. It has three full-time and three GA's.

Mathematical Consulting and Computing
- The Department of Mathematics has a virtual helpdesk, which supports mathematical software only via email. That mail is routed to the "appropriate staff person" who gets back to you with an answer.
- The Office of Information Technology's Peer Training program offers introductory and intermediate short courses on MATLAB and Mathematica.

Programming languages
No programming support was found outside of the possibility of the Supercomputer Academic Consortia Initiative.

High performance computing
Supercomputer Academic Consortia Initiative offers support for high performance computing, but says very little about it on their web page.

Visualization
The Visualization and Presentation Laboratory offers support for scientific visualization as well as a broad range of services including graphic design, publishing, image capture and manipulation and film recording.

Geographic Information Systems
The UMD Libraries offer introductory and intermediate workshops in ArcView and offer support to its patrons in their map room.

Text Analysis
The Laboratory of Applied Ethnography and Community Action Research supports Ethnograph, AnthroPak, Notable, Tally, UCInet and Brother's Keeper.

Image analysis
No centralized support was found.

The University of Memphis (Tennessee Board of Regents)

Statistical Consulting and Computing
The Division of Information Systems offers free support of a wide range of statistical software and analyses.

Mathematical Consulting and Computing
The Division of Information Systems offers free training and support of Mathematica.

Programming languages
No programming support is available outside of the Computational Research on Material Institute, which is focused on HPC in the Department of Chemistry (verified via phone).

High performance computing
Support is available only though the Department of Chemistry's Computational Research on Material Institute (verified via phone).

Visualization
Support is available only though the Department of Chemistry's Computational Research on Material Institute (verified via phone.)

Geographic Information Systems
No central support for GIS is available.

Middle Tennessee State University (Tennessee Board of Regents)

Statistical Consulting and Computing
The Office of Information Technology's Academic Services Group offers free support for a wide range of statistical analyses and software. They also provide optical test scoring services.

Mathematical Consulting and Computing
The Division of Information Systems offers free support of Mathematica.

Programming languages
The Office of Information Technology's Academic Services Group offers free support for programming languages when used for academic purposes.

High performance computing
No centralized HPC services were found.

Visualization
No centralized visualization services were found.

Geographic Information Systems
No centralized support for GIS was found.