Request for Technology Fee Funds: FY21

NOTE: A separate request should be made for each initiative.

I. Department Number/Department Name: 360 College of Computing

Title of Request *(please be brief):* East Campus Maker Space Update and Expansion

Amount of Request *(formula from detailed budget below):* $265,767

Type of Proposal: Atlanta or Dist Lrng/Non-Atl Atlanta

Is this request similar to one funded in FY19 or FY20? Yes (Yes or No)

Are there installation/renovation costs associated with this request? Yes (Yes or No)

If "Yes" then indicate the source of approved funding:
(Note: Tech Fees are not allowed for installation/renovation) GVU Center

Executive Summary of Request (100 words or less):

Enhance and modernize the capabilities of the existing GVU Prototyping Lab, expand the existing lab to accommodate increasing student demand, and create a new make space that offers uniqute fabrication opportunities.

Specific class and/or lab initiative(s) if applicable:

Contact person for this request (incl. phone #): Tim Trent (5-7610)

Responsible faculty for this request (incl. phone #) Keith Edwards, Tim Trent, Thad Starner

Indicate priority per department if applicable: Number ____ of ____

Indicate priority per college or unit: Number 1 of 9

II. Impact on Students - Provide course title, course number, and anticipated enrollments:

Titles/Numbers of Course(s) see Narrative

Anticipated Enrollments

Graduate:	*363*	*(per*	sem	) sem or yr
Undergraduate:	839	(per	sem	) sem or yr
Total:	1,202			

The estimated percent use of the resources in the item by:

Students	80%
Faculty	20%
Other	0%
Total:	100%

Brief explanation of how estimate was achieved.

The Prototyping Lab is a resource provided by the GVU center for the researchers of the GVU center, but is open to campus. As of the last audit (Summer '18), the registered users were ~80% students, 20% faculty/staff.

NOTE: Other impacts on students should be described in narrative to include benefits to the students affected.

III. Detailed Budget - Requested Items by Category *List separately any equipment, software, and other allowable expenses (see Tech Fee Guidelines). There is a formula in the "total column" that multiplies the number of items times the unit price. You may enter a figure into the total column if the unit pricing is not applicable. If you need additional rows, contact the Budget Office to receive a modified form. Software or data license proposals should indicate how many years the item has been funded through student tech fees in narrative.*

Supporting documentation is required *- Include price justification in some form, such as quotations, published price lists, etc. as a separate PDF attachment. All supporting information should be in a single PDF.*

	Proposed Number of Items	Estimated Price per Unit	Total ($)
Stratasys F170	1	$36,460	$36,460
Ultimaker S5 Pro	4	$9,100	$36,400
Epilog Fusion Pro - Vector Cutting Grid, Lens, Jaw Chuck Rotary, Ex	1	$51,640	$51,640
Epilog G2 Fiber	1	$60,000	$60,000
Protomax	1	$26,256	$26,256
Ultrasonic Cleaner	2	$717	$1,434
Salae Logic Pro 8	2	$699	$1,398

Kniterate	1	$9,999	$9,999
Janome HD1000	2	$329	$658
Singer 5523	1	$160	$160
Cricut Maker	1	$400	$400
Hatch Embroidery Software	1	$1,099	$1,099
Juki 4 Needle Flatseamer	1	$9,450	$9,450
Janome MemoryCraft 12000	1	$9,999	$9,999
DI Wire Pro	1	$19,180	$19,180
Swingline Fusion 7000	2	$617	$1,234
Total *(linked to the total amount of request line above)*			$265,767

Please return form via e-mail in Excel format to: techfees@business.gatech.edu. Supporting information only in a PDF file.

IV. Narrative - Provide narrative justification for your intended use of the technology fee funds. Include narrative on how the education or research of the students will be enhanced. To include curricular, co-curricular, and extracurricular benefits expected to accrue to students through provision of this resource, including students outside the unit. Briefly state how information regarding similar technology use elsewhere on campus to benefit from lessons learned, to standardize, or differentiate, and to avoid duplication. Also include how the request aligns with the Strategic Plan of Georgia Tech.

Impacted course: ME 2110, ME 4182, CS 2701, CS 3651, CS 4605, CS 4690, CS 4699, CS 2698, CS 2699, CS 4903, CS 4980, CS 4698, CS 7470, CS 8903

This proposal outlines a set of upgrades to the makerspace facilities sponsored by GVU in Technology Square needed to 1) enhance and modernize the capabilities of the existing lab, 2) provide the ability for the lab to meet increasing demand from students, and 3) create a new lab that offers unique fabrication opportunities. The upgrades outlined here will ensure that this unique campus makerspace remains competitive among peer universities and will add a new first-of-its kind facility for student use on campus.

The specific new capabilities proposed here include an expansion of 3D printing infrastructure, enabling higher quality (and more rapid) fabrication; new circuit analysis capabilities to support beginning users; enhanced laser cutting tools—unique on campus—to allow cutting of metals and other materials; facilities to support development of computerized textiles/soft electronics; and the supporting tools necessary for this equipment. This proposal is open to funding over two years instead of one.

Background

One of the longest-operating makerspaces on campus, the GVU Prototyping Lab is open to the entire campus community and has served individuals from every College at GT since 2006. Among projects conducted in the lab are multi-university research collaborations, academic courses which introduce many students to fabrication skills for the first time, and entrepreneurial development initiatives like Create-X and VIP. In the 14-year history of the lab, the GVU Center has established a proven infrastructure for the maintenance, management, and training on lab equipment, so the only external funds needed are for initial purchase. Long-term costs associated with the equipment, such as inevitable repairs, material costs, and staff to help train new users, are covered by the GVU center. Despite funding and maintenance of the equipment in this space being provided solely by the GVU Center, the reach and benefits of the lab span far beyond a single unit. The GVU Prototyping Lab is an essential asset on the Georgia Tech campus to provide the prototyping skills and research connections students need to develop compelling prototypes, competitive skill sets, and noteworthy project portfolios. Indeed, the Prototyping Lab is a resource for the entirety of Georgia Tech, with current membership spanning over 40 departmental affiliations (i.e., Biomedical Engineering, Aerospace Engineering, Industrial Design, College of Business, etc.).

In addition to the existing maker facilities, there is a steadily growing demand on campus to study the domain of wearable technology, specifically ‘soft electronics’ and ‘e-textiles’. While many individual researchers and instructors are beginning to explore this field, there is no centralized makerspace-style resource for students to learn and use the necessary equipment. Not only does this lack of widely available equipment make it difficult for researchers to explore the field of wearable technology, it also means there is little to no opportunity for academic courses to ‘pilot’ the idea of integrating soft-electronics into their curricula. Given that interest in such a space has been expressed by the same members of the GT community who make use of the Prototyping Lab, we anticipate that e-textiles capabilities would see equivalent use.

Over the years, membership of the Prototyping Lab has steadily increased, especially as Georgia Tech grows more in the Technology Square neighborhood with projects like the CODA building and Tech Square Phase III. The equipment currently in the Prototyping Lab serves as a bottleneck to the number of students who can make use of the space and upgrades are necessary to match rising demand as well as maintain Georgia Tech’s standard of innovation. In the years 2018 and 2019, the lab gained approximately 135 new active users each year, as opposed to the previous record of 64 new users in 2017 (and fewer in previous years). In addition to the increasing number of new users each year, users also maintain status with the lab for the entirety of their tenure at Georgia Tech, so improving our infrastructure and capability to serve students is necessary to match demand.

Proposal

The funds from this proposal will go towards the acquisition of equipment that satisfies this need for modern, professional equipment. The specific equipment outlined in this proposal resulted from a two-phase analysis. First, we gathered feedback from lab constituents on the arenas where growth is most relevant and specific new capabilities are needed. Second, we obtained data from other makerspaces on campus, from makerspaces at competing peer universities, and from individuals in industry as to what equipment and skills are most valuable, to ensure that the lab provides capabilities that are unique at GT and competitive with our peers, useful to the broad disciplines which use the lab, and which represent the greatest potential impact on projects at Georgia Tech. A relatively small portion of the budget is intended for equipment to act as the ‘start up’ catalyst for an E-textiles/soft electronics equipment. A description of each item and its relevance follows below.

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