Request for Technology Fee Funds: FY20

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):* PACE-ICE Expansion for Machine Learning

Amount of Request *(formula from detailed budget below):* $179,500

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

Was this project request funded in FY19? No (Yes or No)

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

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

Executive Summary of Request (100 words or less):

The Machine Learning courses offered in the Online Masters of Science in Computer Science degree continue to be among the most sought after courses in the program. Because of this interest, we propose to expand the existing PACE-ICE cluster with additional hardware to support these courses.

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

Contact person for this request (incl. phone #): David Mercer (5-2518)

Responsible faculty for this request (incl. phone #) Richard Vuduc (richie@cc), Irfan Essa, Tucker Balch

Indicate priority per department if applicable: Number ____ of ____

Indicate priority per college or unit: Number 4 of 5

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

Titles/Numbers of Course(s) CSE6220, CS6476, CS7646

Anticipated Enrollments

Graduate:	*3,741*	*(per*	yr	) sem or yr
Undergraduate:		(per		) sem or yr
Total:	3,741			

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

Students	95%
Faculty	5%
Other	
Total:	100%

Brief explanation of how estimate was achieved.

Primarily student usage for projects and homeworks

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 ($)
dual P100 GPU node	10	$17,700	$177,000
1TB Storage for 5 years	5	$500	$2,500
			$0
			$0
			$0
Total *(linked to the total amount of request line above)*			$179,500

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.

Machine learning is a field of computer science that gives computer systems the ability to "learn" (i.e., progressively improve performance on a specific action) with data, without being explicitly programmed. Within the field of data analytics, machine learning is a method used to devise complex models and algorithms that lend themselves to prediction; in commercial use, this is known as predictive analytics. These analytical models allow researchers, data scientists, engineers, and analysts to "produce reliable, repeatable decisions and results" and uncover "hidden insights" through learning from historical relationships and trends in the data.

Georgia Tech's strategic plan sets goals to be among the most highly-respected technology-focused learning institutions in the world and to sustain and enhance excellence in scholarship and research. With this directive in mind, during last years Request for Technology Fee Funds we submitted and were awarded a request titled “Facility for GPU based Machine Learning”. Using these funds we were able to establish a cluster purpose built to handle the “embarrassingly” parallel computations that are the backbone of the machine learning field. Unfortunately, we are already bumping up against the capacity of this original cluster and expect that we will exceed its limits in the coming semesters as OMSCS enrollment continues to grow. In consultation with the professors teaching these courses, we propose to expand the current hardware investment in PACE-ICE (more information about the PACE-ICE initiative can be found below). Based on current and forecasted usage, we believe that purchasing an additional 10 dual GPU nodes will allow us to continue to fully support the computing needs of these courses, as well as give us space for new courses in the future.

PACE-ICE -
Beginning in 2016, the College of Computing and OIT-PACE joined forces to build an advanced shared educational computation cluster - PACE-ICE (Instructional Computing Environment) - to address the growing number of HPC resources requested by classes in the College of Computing and the School of ECE. Leveraging the PACE team’s expertise in delivering High Performance Computing (HPC) resources, along with investments from OIT, College of Computing, and Tech Fee grants, we have created a campus resource that serves as a model that other departments can join with their own educational funds. PACE-ICE is currently being used by courses in CS, CSE, ECE, and Math, as well as the OMSCS program.

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