

Self Assessment Ethics Form



Section 1: Student Details

Student Name:	Josephine Pfeiffer	Group 1
What course stream are you enrolled on?:	MSc Computer science with Cyber Security	

Section 2: Project title

Proposal number	1
Project title:	Enhancing Kubernetes Autoscaling on IBM Cloud: A Comparative Study of Karpenter and Traditional Methods
Provide a clear statement of your research question(s) or your experimental hypothesis(es).	<p>How does the time efficiency of Karpenter compare to traditional machine auto-scaling mechanisms in Kubernetes environments on IBM Cloud?</p> <p>What are the cost implications of using Karpenter compared to traditional auto-scaling methods in Kubernetes clusters on IBM Cloud?</p> <p>How does Karpenter's approach to resource utilization efficiency compare to traditional machine auto-scaling mechanisms in managing Kubernetes workloads on IBM Cloud?</p>

Section 3: Project description

Briefly explain what you are going to do in your study. Give sufficient detail that a non-expert in the subject can understand what you are proposing to do.:

The study will explore and compare different methods of automatically adjusting computing power (machine/cluster autoscaling) in cloud-based systems using Kubernetes, a widely used platform for managing containerized applications.

The focus will be on two approaches: Karpenter, a new advanced autoscaler, and traditional machine auto-scaling methods, such as the Cluster-Autoscaler.

The study will involve creating a Karpenter provider for IBM cloud and setting up comparable environments using both methods and testing their response to changing workload demands. Key metrics will include scaling time, overall cost, and resource utilization efficiency.

By measuring these factors, the study aims to determine whether Karpenter provides a more efficient, cost-effective, and faster solution for scaling resources compared to traditional methods.

This research is significant for businesses and organizations using cloud computing, as more efficient autoscaling can lead to reduced costs and improved performance.	
Section 4: Data Sources	
Please provide details of your data source, such as name, location and this should include any links to the data sets.	
I will collect data myself through benchmarking experiments on cloud infrastructure.	
Have you checked the terms and conditions of the data source in order to use the data? Do you have permission to use it?	Yes
Section 5: Potential Ethical Issues	
Does your project involve any of the following? Please mark Yes or No for all issues.	
1. Human participants (adults or children)	No
2. Human material (e.g. tissue or fluid samples)	No
3. Human data (e.g. surveys and questionnaires on issues such as lifestyle, housing and working environments, attitudes and preferences)	No
4. Vertebrates, especially mammals and birds	No
5. Any other biological organisms (animals, plants etc.) not previously mentioned	No
6. Military or defence context – is this project sponsored/supported by military organisations or contractors? Is a military application one of the goals or sources of information?	No
7. Funding sources or collaboration with potential to adversely affect existing relationships or bring the University or Department into disrepute (e.g. projects related to gambling, dark markets, dark web, etc.)	No
1. Restrictions on publication - does anyone outside the University have the right to approve or veto publication, edit or request changes to the contents of publication or restrict publication of this work in any other way?	No
8. Overseas countries under regimes with poor human rights records or identified as dangerous by the UK Government's Foreign, Commonwealth Development Office.	No
9. Applications that could potentially involve unethical practice, including potential dual-use applications which could be unethical (e.g. projects involving tools or data that can be used to attack systems or people)	No
If you answered No to all the above bar Q8, you do not need an ethical approval.	
If you answered Yes to any of the above bar Q8, you must complete the Fast-Track Ethical Approval Form, and submit it to your project advisor (or module leader), for approval by the Departmental Ethics Officer(s).	
The Fast-Track form is designed to verify specific conditions. If certain conditions are not satisfied, the form will guide you to complete a full Ethical Approval Application, to be approved by the Physical Science Ethics Committee. This process can take several weeks to complete.	
Section 4: Student Declaration	
I have considered the ethical implications of this project and have identified no significant ethical	

implications requiring an ethics application submission to the Physical Sciences Ethics Committee.

Student Name: Josephine Pfeiffer



Date: 4 September 2024

Instructions for Project Supervisor. Satisfy yourself a Fast Track form is not required, then approve this form yourself. Do not forward it to the ethics committee.

Supervisor declaration:

I have checked this form and I understand that completion of this form indicates that from the ethical point of view I am willing to share responsibility for the work being conducted.

Supervisor Name: Nida Zeeshan

Date: 06/09/2024