National College of Ireland

Configuration Manual

MSc Research Project
cloud computing

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MSc Project Submission Sheet

School of Computing

Student Name: …praveen reddy masannagudam
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Student ID: 22246592
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Programme: …Msc in cloud computing **Year:** …2023-2024
…… ……..

Module: …Research Project
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Lecturer: …Yasantha Samarawickrama
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Submission Due Date: …12-12-2024
……

Project Title: …Enhancing performance and security mobile cloud computing through machine learning based edge computing integration
……

Word Count: ……600…… **Page Count:** ……6
……

I hereby certify that the information contained in this (my submission) is information pertaining to research I conducted for this project. All information other than my own contribution will be fully referenced and listed in the relevant bibliography section at the rear of the project.
ALL internet material must be referenced in the bibliography section. Students are required to use the Referencing Standard specified in the report template. To use other author's written or electronic work is illegal (plagiarism) and may result in disciplinary action.

Signature: ……praveeen reddy
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Date: ……12-12-2024
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System Requirements

Hardware Requirements:

- CPU: Intel Core i5 or higher
- RAM: 16GB minimum
- Storage: 100GB available space
- Network: Stable internet connection

Software Requirements:

- Python 3.9 or higher
- TensorFlow 2.x
- AWS CLI configured
- Git (latest version)

Installation Steps

1. Environment Setup

```
# Create virtual environment
python -m venv edge_cloud_env
source edge_cloud_env/bin/activate  # Linux/Mac
```

```
edge_cloud_env\Scripts\activate     # Windows


# Install required packages
pip install tensorflow pandas numpy scikit-learn boto3 matplotlib
```

2. AWS Configuration

```
aws configure
AWS Access Key ID: [Your access key]
AWS Secret Access Key: [Your secret key]
Default region name: us-east-1
```

3. Dataset Configuration

Place datasets in the following structure:

```
project_root/
├── data/
│   ├── nsl-kdd/
│   │   ├── KDDTrain+.txt
│   │   └── KDDTest+.txt
│   └── ids2018/
│       └── 02-14-2018.csv
```

Execution

1. Start System

```
python edge_cloud_system.py
```

2. Monitor Output

i. Check terminal for progress

ii. Results saved in 'results' directory

iii. Logs stored in 'edge_cloud_system.log'

Troubleshooting

Common Issues:

1. Memory Error:
    - Increase chunk_size in IDS data processing
    - Reduce batch size in model training
2. AWS Connection Error:
    - Verify credentials
    - Check internet connection
    - Ensure region is correctly set
3. Dataset Loading Error:
    - Verify file paths
    - Check file permissions
    - Ensure correct file format

Performance Optimization

1. Edge Node Settings:
    - Adjust capacities in EdgeNode initialization

- Modify processing thresholds

2. Model Configuration:
    - Adjust batch_size for memory constraints
    - Modify model architecture if needed

Maintenance

1. Regular Updates:

    ✓ Update Python packages monthly

    ✓ Check AWS credentials expiration

    ✓ Monitor log files growth

2. Backup:

    ✓ Models: Daily to S3

    ✓ Results: After each run

    ✓ Logs: Weekly rotation

Security Configuration

1. AWS Security:

    ✓ Use IAM roles

    ✓ Enable bucket encryption

    ✓ Set appropriate permissions

2. Data Security:

- ✓ Encrypt sensitive data
- ✓ Use secure connections
- ✓ Regular security audits