



SHOWCASE 2024

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Final year computing projects
SETU Carlow campus





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The Computing Department at SETU's Carlow campus has been a central and productive component for over 40 years. During this time the department has developed and enhanced its reputation for producing industry-ready graduates for leading national and international companies as reflected by the breadth and tenor of the projects (and associated technologies) shown in this brochure. Work placements are offered as part of all undergraduate ordinary and honours degree programmes (all of which are applied in nature) including Software Development, Information Technology Management, Interactive Digital Art and Design, Computer Games Development and Cybercrime and IT Security. The department has 40 highly qualified academic staff, committed to the ongoing progression and development of the department for the betterment of the 500+ students currently enrolled.

The department maintains an international perspective technologically, socially and culturally by collaborating widely with other computing departments and higher education providers with active undergraduate and postgraduate research links with the Netherlands, France, China, Germany, Finland, Norway, Hungary and the UK. The department has strong collaborative relationships with key local, national and international ICT organizations ensuring that students acquire up-to-date skills. For example, the local software development wing of UNUM, the international insurance company, sponsor the Software Development Centre at Carlow.

Computing Department Programmes at SETU Carlow campus

The department offers a range of programmes from certificate level right through to masters and PhD incorporating the full range of skills including Programming, Project Management, Systems Administration, Software Engineering and many more.

UNDERGRADUATE

- BSc (Honours) Computer Games Development
- BSc (Honours) Software Development
- BSc (Honours) Cyber Crime and IT Security
- BSc (Honours) Information Technology Management
- BSc (Honours) Computing in Interactive Digital Art and Design
- BSc Information Technology Management
- BSc Software Development
- BSc Computing in Interactive Digital Art and Design
- BSc Cybercrime and IT Security
- Higher Certificate in Science Computing

POSTGRADUATE

- MSc Data Science
- MSc in Cybersecurity, Privacy & Trust
- MSc in Applied AI
- MSc Information Technology Management
- Higher Diploma in Science in Computing – Systems and Information Technology Services
- Higher Diploma in Science in Computing – Software Development for Games and Apps



Our computing graduates are sought after by leading organizations and our alumni are working for global leaders including:

UNUM	Bord na Mona	Eureka
IBM	Netwatch	DataPac
Apple	Google	Pfizer
Dell Technologies	Verizon	Blacknight
Microsoft	SAGE	NeoData
SAP	Fineos	GameSparks
Amazon	TrendMicro	Bank of America Merrill Lynch
Intel	Havok	Bank of America
Verizon	Demonware	Sun Life
VMWare	PlayFirst	State Street
Symantec	Aeria Games	Department of Agriculture, Food and Marine
HP	SRA (Security Risk Advisors)	Accenture
Kerry Group	Sony Entertainment	Workday
Tirlán	Crossell	
Glanbia		



Software Development

Project title	Technologies	Student
Energy Insight Hub	NET Blazor, C#, Python, Arduino Nano	Alex Paquette
PaceRunner	JavaScript, CSS, React, Firebase, STRAVA API	Sebastian Firsaeav
CodeHub	EJS, Node.js, Python, PHP, SQL, Compliex API	Sam Cullen
STARMAN	C#, ASP.NET, MS SQL, IIS, CSS	Robert Holohan
Interactive Map of SETU Carlow	Firebase, Java, Android Studio, Flask, Python, Html, CSS	Marcel Zama
Spell Slinger	Android Studio, Kotlin, Jetpack Compose, Python, Firebase, SceneView, Google Maps Platform	David Darigan
BookByte	Android Studio, Kotlin, TypeScript, Firebase	Conor Brooke
Employee Scheduling & Roster Generation	Flutter, Firebase, Python, Flask, Postman	Liam Durkan
Grade Sheet	React, Python	Denis Perepelyuk
Swift Lift	React, Python, MongoDB, Flask, CSS	Nojus Satikauskas
SenseAssist	Kivy, Python, Tensorflow-lite, pytsx3, pleyer, OpenstreetMap	Daniel Mooney
Scenic Route Planner	JavaScript, HTML, CSS, MapbBox API, OpenStreetMaps API, GeoJSONs, Python	Jake McDonnell
Route Navigator	C++, Typescript, JSDoc, Svelte, XMake, NodeJS, Drogon, Raspberry Pi, Sunfounder PiCar	Chi Huu Huynh
Sentiment Analysis for Social Media	Python, Flask, Keras, TensorFlow, PRAW API, HTML, CSS, ChatGPT API	Mantas Macionis
Automated Ticketing System	C#, Angular, Bootstrap, UiPath Studio, Microsoft SQL Server	Sarah Martin
DriveCare	Python, Django, Angular, Supabase, 46Elks API, Google Routes API	Adam Lambert
SoundSoul	Android Studio, Kotlin, Jetpack Compose, Material UI, Firebase, Spotify Web API	Piotr Artman
FAUNA	Android Studio, Kotlin, Anaconda, Jupyter Notebooks, Python, Tensorflow, ChatGPT	Joshua Wilkinson
SafeDrive	React-Native, Expo, Node.js, JSX, TensorFlow Lite, Python, Anaconda, Google ML Kit, OpenMaps API, Firebase	Shane Kennedy
Diversity in Computing	Flask, Python, HTML/CSS, Scrapy, Werkzeug, PostgreSQL, NLTK, OpenAI API, openpyxl	Daniel Giedraitis
Sports Tracker	Android Studio, Flutter, Javascript, HTML, CSS, NODEJS, React	Tolu Ibiwoye
Bridges Puzzle	Flutter, Firebase	Ming Kit Choy

Games Development

Project title	Technologies	Student
The Upper Cliff Valley	SFML, Visual Studio	Joseph O'Keeffe
Eco Circle City Building Game	SFML, C++, Visual Studio	Haotai Xiong
Exploring Monte Carlo Tree Search in Chess	Pygame, stockfish	John Sinnott
Gills & Glory (RTS Game)	SFML, C++, Visual Studio	Lukas Kmitas
Legend Terrain	OpenGL, C++	Conor McDonagh Rollo

Interactive Digital Art & Design

Project title	Technologies	Student
Side Scroller Game	Java Mobile	Martyna Margielska
Vertical Scroller Game	Godot PC	Adam Kane
Syrian Memories	HTML, CSS, JS	Abeer Abouhajar
Escape Room / Mystery Game	Java, Unity	Aine Cleary
Character Design-3D Modeling / 3DPrint	HTML, CSS, JS, Blender, 3D Printing	Alisa Altane
Visual Novel	Maya, AE, Premiere P	Enya Conroy
Animation	Maya, AE, Premiere P	Milo Silvers

IT Management

Project title	Technologies	Student
JourneyAssist	MapBox, CSS, JavaScript, PHP, SQL, GPS, HTML, Location-based Data	Éamonn Kelly
Clothing Rental Business for Female International Students in Ireland	HTML, PHP, SQL	Nao Endo
Technological Advances in Bee Rental	HTML, PHP, SQL, CSS, API, Openstreetmap	Saadatoul Astheerah Mislan
Second Life IT & Recycle	HTML, CSS, JavaScript, PHP, MYSQL	Domínik Galgus
Smart Parking	Java, JavaScript, CSS, C++, GPS	Zhiyuan Xu
Bitesize	HTML, CSS, API, PHP, Thinkable	Patrick Bayo





Cybercrime

Project title	Technologies	Student
CyberTools - A Learning Platform for Cyber Security Professionals	HTML, CSS, JavaScript, PHP, XAMPP, MySQL	Laura Chudzio
Reverse Engineering an Automotive OEM Protocol over a CAN Bus	PEAK System, PCAN Basic, Canon SDK, Visual Studio 2022, QT Creator, QT Designer, PCAN USB to CAN Bus Connector	Gary Morrissey
Auto OSINT	JavaScript, CSS, HTML	Liam Moore
Unified Vulnerability Scanning Engine and Management System	Python, Flask, HTML, CSS, JavaScript, SQL, Nmap, OpenVAS, OWASP ZAP	Andrew Gilbey
Ignis, An AI-Powered Vulnerability Management Assistant	Python, GPT 3.5 Turbo, langChain, Pycharm, Nessus Essentials, Nmap, Zap, ChromaDB	Khairul Syahrean
Asset Identification and Risk Assessment for SME's	Python, PyQt, Python Libraries eg. XMLtoJSON, NVD API, Digital Ocean, Nmap	Andrew Skelly
Eirguard - Governance and Compliance App	Swift, SwiftUI, Postgresql - Supabase	Peter O'Hare
CipherCraft - Learning Platform for Cryptography	Python, Flask, JavaScript, HTML, CSS, SQL	Josh Casey
Incident Monitoring Tool	Java, PHP, MITRE's API & Tactics and Techniques, Eclipse	Mark Doyle
PhishGuardian - Web Based Learning Tool for Older Adults	HTML, PHP, JavaScript, CSS, SQL	Robert Stynes
Handheld Pen Testing Tool	Python, Wireshark, VNC, Raspberry Pi	Shane Kelly
Security Testing of Infrastructure as Code	Python, YAML, HTML, CI/CD Pipelines, AWS Architecture, EC2, VPC	Syed Zarrar Shah
CyberSecurity Escape Room Game	C#, C++, Unity	Adam Wynne
Home Network Security Analyzer	Python, Flask, NVD, Json, HTML, CSS	Matthew Kavanagh
Implementing Runtime Security Monitoring for AWS Container Clusters	AWS, ECS, Security Monitoring, CloudWatch, CloudTrail, Lambda	David Williams
App Network Insight	Android OS, iOS, Kali OS, Wireshark & Nmap	Lauren Kelly
AI manipulation: Investigating AI-assisted Cybersecurity Attacks	Phyton, Pycharm, NMAP, Bloodhound (sharpound), Powerview, OpenAi API , CVE API, PyQt5, PyQt-designer	John Brennan

Data Science

Project title	Technologies	Student
Machine Learning Procedure for the Detection of Canine Eye Diseases	Python, Jupyter Notebook, Tensor Flow, Keras, Pandas, Matplotlib	Ciara Farrell
Evaluation of the Relationship between Social Media Sentiments and Customer Satisfaction using Transformer Models	Python, Jupyter Notebook, sklearn, Natural Language Processing (NLP), Transformers, Web Scraping, NumPy, Pandas	Timileyin Samuel Akintilo
Application of Reinforcement Learning Methodologies in Algorithmic Trading : Navigating Financial Frontiers	Python, Jupyter Notebook, NumPy, Pandas, Matplotlib, TensorFlow, Keras, scikit-learn, RLLib, Backtrader, SQLite	Sravan Kovelamudi
Comparative Analysis of Global Migration Routes: A Study of Migrant Fatalities and Influencing Factors	Python, Jupyter Notebooks, Scikit-learn, TensorFlow, PyTorch, GeoPandas, Shapely, MySQL, StatsModels, Matplotlib	Amanuel Mebratu
Cross-Cultural Sentiment Analysis on Twitter: A Comparative Study of Global Perspectives on the Launch and Review of Apple Vision Pro	Jupyter Notebook, Pandas, Numpy, Spacy, Nitk, Sklearn	Abin Sojan
Liveness Detection for Face Recognition with Facial Features and Movements Using Machine Learning	Python, PyCharm, Pandas, NumPy, torch, OpenCV, YOLO, Scipy	Sumanth Polati
Brand Reputation Management Using NLP	Python, Pandas, Matplotlib, Natural Language Processing(NLP), scikit-learn, Selenium	Nitha Charuvil Divakaran
Document Organization in Content Management Systems	Python, Pandas, Matplotlib, NLP, scikit-learn	Sneha Chooraparayil George
Enhancing Educational Video Content Retrieval: Natural Language Processing for Precise Query Understanding and Content Identification using GEN AI	LLAMA Model, NLP, Pandas, Numpy, Gen AI	Shubham Pandey
Detecting Anomalies in Bitcoin Trading	Python, Machine Learning algorithms, SQL, JAVA, API, Jupyter notebooks, Detecting Anomalies in Bitcoin Trading, Seaborn, GIT	Arjun Kapadia
An Analysis of Human Behavior in Online Platforms: Data Science Exploration	Python, numpy, pandas	Pranjal Payal
Reinforcement Learning Applications in Health care: Helping in Health Care Decision Making for Long Term Benefit of Patient	Python, Jupyter Notebook, NumPy, Pandas, Matplotlib, Tensor Flow, Keras, Scikit-learn, RLLib, SQLite	Sreelakhmi K Rajeevan
Enhancing Road Safety: Helmet Detection System Using Computer Vision	Python OpenCV, pandas, numpy, TensorFlow, Keras, scikit learn, Seaborn, Deep Learning	Dawood Ali





Cyber Security, Privacy & Trust

Project title	Technologies	Student
Analyzing the Effectiveness of Deep Packet Inspection (dpi) Techniques in Detecting and Mitigating DNS Tunnelling Attacks	pfSense, Snort IDS, GNS3, Wireshark, SecurityOnion	Mosopefoluwa Adefuye
A Comparative Study of DLP Strategies in Email Systems and Their Impact on SOC Efficiency	Email content filtering and contextual analysis, Data Discovery and classification, Artificial Intelligence and Machine Learning, Email policy enforcement, SIEM	Edet Bassey
Mitigating OWASP T10 Risks for Kubernetes with a Cloud-Native Response Engine	Kubernetes, Falco, Falco Talon	Nigel Douglas
Investigating the Cybersecurity Posture of Higher Education Institutions in Ireland. An IT Professional Stakeholder Perspective	NIST CSF, Cybersecurity professional interviews	John Dunne
Implementing Geolocation Mapping of an Attacker's PC Using IP Address and Logs in SIEM Solutions: A Comparative Study between Azure Sentinel and Splunk	SIEM, Azure Sentinel and Splunk	Bhupal Gurung
Children and Cybersecurity - Cyber Threats and Data Hacking in Smart Toys and Online Games	Network Forensics, Network Sandboxing	Etsuko Michelle Hegarty
The Danger of AI Virtual Assistants on Data Protection and Privacy in Today's Work Environment	Python, Matplotlib, ChatGPT and GPT Store	Yasdeo Jugessur
How to implement Threat Hunting in Small to Medium-Sized Enterprises	Open-source SOC tools (Wazuh, Velociraptor)	Rizo Jusufovic
Blockchain-based Public Notary System for Secure and Efficient Document Authentication	Node.js, Next.js, Typescript, Web3, Ethereum, EAS-SDK	Daniel Lazarczyk
Enhancing Compliance and Security in Agile Environments: A Tool Assisted DevSecOps Approach	Python, Wazuh, MISp, Suricata, Zeek	Jane Mac Donald
A Multi-Dimensional Approach To Cybersecurity Vulnerabilities	Python, Matplotlib, R, Jupyter Notebooks	Benie Mambouana
The Human Element of Cybersecurity, investigating the impact of Social Media on Employee Security Awareness Training	O365 tools Viva Engage, Teams and Google Training Tools	Michael Mitchell
The Strategic Impact of Generative AI on Privacy and Trust in the Public Sector	Python, pandas, analytics tools, graphing libraries, databases, LLMs and AI	Dewaspati Shibnauth
Towards a Reusable Framework for Converged IT - OT Converged Security Operations Centers	Azure, Security Onion, pfSense Firewall, Snort IDS, Modbus, DNP3, OPC	Shane Sweeney
Assessing the Ease of Implementing Security Features by Software Engineers in Frequently Used Web Frameworks	Python, Java, NodeJS (Typescript), ReactJS, NextJS, Angular	Jakub Zurakowski

compuCORE

Established over 20 years ago, and home to 20 academics and 15 postgraduates, compuCORE is a research centre of SETU with five main research interests:

- **Game Based Research** including Gamification and Game Based Learning
- **User-Centred Systems** including UI/UX, User Adaptive Systems, Technology Enhanced Learning, Ambient Assisted Living (AAL), XR, and Wellbeing
- **Intelligent Systems** including AI and Machine Learning, Internet of Things, and software testing
- **Networks and Security** including Network Design and Management, Cybersecurity, and Blockchains
- **Equality and Ethics** including Gender Equality in Computing and Ethics

compuCORE has strong links with industry, and has been involved with numerous collaborations, largely funded by Enterprise Ireland and the Irish Research Council. compuCORE has also been successful in several significant National and EU funding applications, such as:

- **INDICATOR** (Funded by HEA) to build capacity in incorporating the gender dimension into computing research across the Irish higher education sector.
- **DESQOL** on improving the quality of life of Coeliac teenagers using novel hardware and software to encourage behaviour change.
- **Join-in** on games for addressing cognitive decline and social isolation in elderly people.

A selection of compuCORE's current projects:

- Governance Tokens and Smart Contract Composability: The Risks of Metagovernance
- Sustainable Deep Neural Networks for Machine Translation
- An investigation of dynamic temperature monitoring and control in modular data centres
- User-Centred Systems Machine Learning the Tracking, Modelling, and Predictive Analysis of Learning Behaviour
- The Gamification of Corporate e-Learning



If you're interested in exploring a potential R&D project, talk to one of our staff members today. You may qualify for funding, such as Enterprise Ireland's Innovation Voucher and Innovation Partnership Programmes.

You can also look at our website: <https://compucore.ie/industry> to find out more about what we do or email us on: compucore.cw@setu.ie

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