Timur Ismagilov

ti1e24@soton.ac.uk

EDUCATION

University of Southampton | Oct 2024 – June 2028

PhD Researcher, Computer Science | Agents, Interaction and Complexity Research Group

In connection with Responsible AI UK, my research area is in Visual Place Recognition, Computer Vision and Robotics. I look to develop effective place recognition algorithms capable of running on resource constrained devices.

Imperial College London | Sept 2020 - June 2024

MEng + BEng in Electronic & Information Engineering | First Class Honours

● Machine Learning ● Computer Vision & Pattern Recognition ● Mathematics for ML ● Self-Organising Multi-Agent Systems ● Deep Learning ● Machine Learning for Finance ● High Level Programming ●

Ibstock Place School | - July 2020

A*A*A* for Maths, Physics, Further Maths at A-level

12 A* grades at GCSE with Free Standing Maths Qualification

PUBLICATIONS

T. Ismagilov, B. Ferrarini, M. Milford, T. V. T. Nguyen, S. Ramchurn, and S. Ehsan, "*On Motion Blur and Deblurring in Visual Place Recognition*", 2024, IEEE Robotics and Automation Letters. DOI: 10.1109/LRA.2025.3554103

SKILLS

C++, Python, Machine Learning (TensorFlow, Keras, PyTorch, Scikit-learn)

F#, Web Development (React, NodeJS, Javascript, HTML, CSS)

Compilers, Communication Networks

PROFESSIONAL EXPERIENCE

Thruvision | *Machine Learning Engineer Placement*

April-October 2023* | *Abingdon, Oxford

- Researched and developed specialised deep learning programs for classification and detection of concealed objects in images, using Python TensorFlow and Keras API.
- Implemented feature engineering pipeline for optimal pre-processing of data prior to use in computer vision related tasks, including image construction using depth information.
- Designed and developed a client-server platform for efficient camera data collection, efficiently integrating it with existing codebase.
- Made use of knowledge in software systems, camera models (coordinate systems and scene planes) and signals, as well as opportunities to research frontiers in computer vision.

Skills: Python, C++, TensorFlow, Keras, Scikit-learn, Computer Vision, Software Systems, Camera model

Procter & Gamble | *I.T Internship*

July-September 2022* | *Weybridge, London

- Planned, designed and implemented a Data Collection Toolkit for efficient management and organizing of Metaverse projects by the Digital Experiences Team.
- Designed and Created Video-Audio Training videos for Ambassadors use prior to public events in the Metaverse hosted by P&G.
- Saved £1000's per year and hours of time using new centralized Workflow structure.

Skills: Workflow Structure & Automation with SharePoint, PowerApps & Power Automate, Project Management

PROJECTS

Simultaneous 6DOF Pose Estimation for Multiple Small Objects | *Masters Project*

October 2023 – June 2024 | *London*

- Conducted extensive literature review for research of 6DOF pose estimation methods.
- Self-proposed and implemented two modifications to a state-of-the-art model: attention-enhanced feature extraction and T-GCN pose refinement – a first for this task.
- Focused on improving performance in localising small, texture-less and occluded objects seen at training time. Required extensive tuning of proposed modifications.
- Achieved marginal improvement in unseen scenes and significant improvement in seen scenes.

Skills: Python, PyTorch, Machine Learning, Deep Learning, Computer Vision

Deep Learning & Kaggle | *Group/Personal Projects*

May 2021 - | *London*

- Developed complex parameter tuning and decision tree ensemble training algorithms for protein function prediction, achieving silver (top 5%) in first Kaggle contest with 1500+ teams.
- From scratch, derived and implemented:
  - Conv2D, BatchNorm2D, Pooling2D and Linear layers.
  - U-Net like segmentation model to perform encoding and decoding of images in brain MRI dataset, achieving 95%+ accuracy.
  - Neural network and decision tree algorithms to predict house prices in California and Wi-Fi signal strength respectively.
- Performed in-depth cross-validated hyperparameter tuning on deep CNN models on ImageNet dataset. Supported with quantitative and qualitative analysis.
- Derived mathematical foundations of Variational Auto-Encoders (VAE), implementing one for analysis on MNIST dataset.
- Researched and implemented DCGAN's and WGAN's for creation of Monet-like paintings from photos as well as CIFAR-10 image generation.
- Derived and implemented PCA, LDA, Clustering and Bagging algorithms for pattern recognition tasks involving time-series tactile data.

Skills: Python, Machine Learning, Computer Vision, Data Science, PyTorch, TensorFlow, MATLAB

C to MIPS Compiler | *Pair Project* | **GitHub: https://github.com/itmr1/CtoMips-Compiler**

March 2022 | *London*

- Fundamentally, without libraries, implemented a compiler for pre-processed C90 to MIPS Assembly, including a Lexer, Parser and test suite.
- In 2000 lines of code, the compiler successfully interprets global variables, functions, expressions that are logical, assignment, relational, arithmetic and conditional statements including switches, for and while loops and jump statements.

Skills: C, C++, OOP, MIPS Assembly Language, Compiler Design

Mars Rover | *Group Project* | **GitHub: https://github.com/itmr1/Mars_Rover_Group23**

May 2022 | *London*

- Worked in a team of 6 to deliver 7 critical sub-systems of a Mars Rover, with primary responsibility of the Command sub-system.
- Coordinated with team to create a system of web applications and database to receive and display raw data (Obstacles, Battery, Location), as well as send movement commands to Rover FPGA.
- Implemented A-star algorithm to find an optimal path around obstacles and enable autonomous movement.

Skills: JavaScript, C++, React JS, Node JS, SQL, CSS, Web Application Development, Project Management

MIPS CPU | *Group Project* | **GitHub: https://github.com/itmr1/MIPS_CPU**

November 2021 | *London*

- Created a working Bus-based interface 32-bit CPU Using Icarus Verilog, executing over 150 Instructions.
- Used shell scripting to create a compiler and test-bench against other Verilog MIPS CPU's.
- Included filtering in test-bench script for optimised testing user interface.

Skills: Verilog, Shell Scripting, Computer Architecture, Project Management

ISSIE | *Solo & Group Project* | **GitHub: https://github.com/tomcl/issie**

February 2023 | *London*

- Issie is a digital circuit design simulator written in F# and consisted of over 40,000 lines of code when I began work on it, requiring quick familiarisation of its implementation in this language.

- Successfully implemented a completely new interface to support my new scaling, flipping and rotation features, as well as a new distinctive style of logical components. My design was chosen to be integrated into production.
- Regularly coordinated with team to avoid redundant code and integrate our features together.

Skills: F#, Codebase proficiency, Teamwork