arm

Early Careers Business Group Information

Find out about the intern opportunities available for the UK & Ireland across our business groups

Our **hiring process**

Intern applications open from Friday 7th October – Monday 7th November 2022

STEP 1

APPLY

Pick a role that best meets your skills and interests. If you see a business group you like the sound of in here, tell us when you apply!

STEP 2

SUPPORT

Let your recruiter know if you have questions or if you need any support.

STEP 3

INITIAL INTERVIEW

Tell us what fuels your passion for progress using Hirevue.

STEP 4

FINAL INTERVIEW

Meet our teams, learn more about Arm and share your talents, in person.

How to use this booklet

Find out about our business groups

Read this booklet before you make your internship application. All of the groups listed have opportunities available at one of our UK&I locations (Cambridge, Manchester and Sheffield)

Let us know when you apply

If there is a particular business group that stands out to you or you are interested in let us know on your application. If you meet the criteria we will try to ensure your application is seen by that group first. If application volumes are high or not available at your preferred location, we will forward your application to a similar group.

Still not sure?

You may be open to any opportunity and that's perfectly fine! You can use this booklet to help your understanding of the business.

ATG Architecture & Technology Group

The Architecture and Technology Group (ATG) provides leadership for the technical direction of Arm, Arm's partners, and the broader computing industry in a collaborative way. We model and develop technologies that will be used in new products and markets and maintain Arm's leading position in the mobile and embedded spaces.

ATG works closely with all groups within Arm and with our partners. Our work touches on many aspects of computing, for example:

- CPU architecture development and deployment
- Systems architecture development and deployment
- Development of standards allowing software to run on Arm seamlessly and securely
- Software tooling to support architecture development and publication
- Technical authoring of reference material for developers using Arm Technology

What could a placement with us involve?

Within the CPU and systems architecture teams, interns in ATG will be working at the interface of software and hardware developing, prototyping, and writing Arm's architectural specifications. There is opportunity for projects spanning topics such as security, data standards, system integration and architectural verification. You will work on a project as part of a larger team to deliver cutting edge technology with opportunities to develop existing and new skills and perspectives.

ATG Architecture & Technology Group

The Architecture Information Group (AIG) develops different forms of architecture specifications and software to enable the publication and maintenance of Arm's architecture reference manuals and machine-readable specifications. These are detailed foundational documents for anyone developing hardware or software to use with Arm products. There are two key roles within this team:

- As a software engineer, you will work on tools that allow architectural definitions to be developed, represented and consumed, and consistently generate detailed reference materials which include machine-readable specifications, manuals and reference models.
- As a technical author, you will be working closely with colleagues in ATG to capture complex architectural definitions, provide interpretation for general readership by developing different forms of content.

About you:

You will have an interest in computer architecture, curiosity for future trends in computing, and be willing to work with new technologies and frameworks. We have a very diverse set of development environments in ATG so we do not have any specific technical requirements, however familiarity with a scripting language, such as Python, would be helpful in all roles. We will provide training for any new tools and languages that you might need.

Client Business Group

The Client Business Group delivers compute solutions to create new services and user experiences and enhance developer experience. Our unit is responsible for creating what people want and creating the best experience for when they use it. The Client Business Unit has three core areas:

- **Client Line of Business Group**
  We are responsible for Arm's business in the mobile, large screen compute, wearables / XR and home segments – all of these are technologies used every day across the globe by billions of people.

- **Ecosystem and Engineering Group**
  We make sure that Arm has insight into the problems and opportunities by those who turn technology into the experience you have when you use them. This includes researching and working on collaborative solutions to give the best you the best experience using an Arm device. We work directly with Arm's large, diverse ecosystem – from developers to artists to operating systems, silicon partners, the final consumer and more.

- **Game Engine, Graphics Engineering, UX Performance and Developer Advocacy teams**
  We produce research, analysis, demo apps/content, modelling and best practice documentation in our areas. We work on ray tracing (technique for modelling light transport), rendering and game engine pipelines, current critical and future CPU and GPU use-cases, best use of new technology about to be released as well as engaging with developers.

Client Business Group

What could a placement with us look like?

You will get your own real-world research project, investigating a future use-case in the client domain. You will have a dedicated mentor to provide you with the technical and practical help that you need to start your career. We will treat you like another engineer on the team, having the chance to participate in knowledge sharing, having your ideas heard, solving problems independently and being supported by the rest of the team.

Some current and previous projects include:

- Multi-Agent Reinforcement Learning on Arm CPUs
- Shadow Maps
- Face-Recognition on DTV
- Performance Profiling Future Use-case Mobile Apps

About you:

We are looking for students with excellent problem-solving skills who are creative and curious with good communication and ability to connect with others. You will need to be a fast learner who enjoys picking up new skills and applying them as well as being keen to experiment with an interest in new/future tech and for some teams: an interest in gaming.

CPU Group

Arm CPUs are the heart of digital electronic devices. The **CPU** group develops and delivers all Arm CPU IP, from the Applications processor in your phone to the Real-time processor in your car and the Microcontroller in every electronic gadget around you. We are a multi-disciplinary group with several projects running in parallel, each project requiring hardware and software engineers with a variety of skillsets working closely together to produce groundbreaking CPU products:

- HW – Design: Build early prototypes, design micro-architecture and develop RTL using HDL languages (e.g. SystemVerilog) and scripting, and optimize PPA (power, frequency, area).
- HW – Verification: Design and develop testbenches using multiple approaches (e.g. simulation/formal, pseudo-random/directed) and programming and scripting languages (e.g. SystemVerilog, C++, assembly, Python) to verify functionality and ensure quality.
- HW – Implementation: Design and develop flows to turn IP into actual chips using scripting languages (e.g. Python) and powerful specialized tool suites, and enable PPA analysis and optimizations.
- SW – Performance modelling: Design and develop software models using advanced programming techniques (e.g. object-oriented programming in C++) and scripting, and generate representatives workloads, to enable micro-architecture exploration and performance evaluation and optimization.
- SW – SVOS (System Validation and Operating Systems): Design and develop random instruction generators using software programming languages (e.g. C, C++) and scripting, and port and run high-level workloads on top of full operating systems, to find hardware and software bugs.

CPU Group

What could a placement with us look like?

As an intern in the CPU group, you will have a dedicated technical mentor to help you learn and develop. You will join one of our CPU project teams and be given work that will contribute to current and future Arm CPU developments and power the next generation of digital electronic devices!

About you

Our work is very collaborative and deeply technical, so we are looking for people who:

+ Enjoy working collaboratively as part of a team.
+ Enjoy finding creative solutions to complex technical problems.

In addition, an internship in the CPU group will be best suited to people who:

+ Are interested in and want to learn more about how computers/CPUs work
+ Wants to develop their skills in scripting, logic design, verification, software programming
+ Study electronic or computer engineering and similar subjects, either as part of a degree or as personal projects.

CT Central Technology Group

The Central Technology Group delivers technology leadership by identifying and developing a sustainable pipeline of innovative technology to create faster, smaller, better products, every year.

What could a placement with us look like?

Interns / PTUGs in Central Technology would be working to shape Arm's future technology strategy. You will have the opportunity to make a big difference creating the world's best products. We have intern vacancies in teams that work in the following areas: CPUs, Computer Vision, Future Architecture Development, Image Processing, Algorithm Design, Performance Profiling and optimizations.

About you:

Candidates from any engineering background would be welcome to apply, we would ideally like to see candidates with some knowledge of C/C++ and/ or Python. In addition, any interest in PyTorch/Tensor, or low-level programming, image processing, or computer vision, would be helpful.

We are also looking for candidates who want to innovate, make a high impact, are curious, and like to collaborate.

If you have an interest in knowing how computers work and how we improve our designs, then Central Technology would provide a fascinating internship placement for you.

DSG Development Solutions Group

The **Development Solutions Group** are responsible for creating the tools people use to develop their Arm-based products such as compliers and debuggers, IDEs, performance profilers, optimised libraries, various CPU (central processing units) models and emulators.

Our customers and their customers in turn, are building all kinds of products from consoles to cars, doorbells to data centres and super computers to space-ships.

We work in small to medium size teams. Behind the scenes we use common tools like git, Gerrit and Jenkins for CI and Jira for issue tracking all glued together with plenty of Python!

DSG Development Solutions Group

What could a placement with us look like?

Within each team you will be given problems to work on that will make use of your existing knowledge and skills, whilst also requiring you to learn something new (be that a new language, an internal codebase or a new API). You will participate in different aspects of commercial and open-source software development, from product design and implementation to testing and support with plenty of help on hand from our team as you learn.

About you:

First and foremost, we are looking for enthusiastic and creative people with an interest in computers and an ability to write software.

You may be about to earn a degree in computer science, software engineering or similar but we also welcome applications from students with relevant experience; our teams include people who have studied physics, electrical engineering, biology, psychology and more!

Other must have:

- Ability to problem solve and an enquiring mind
- Diligence and thoroughness in all aspects of work
- Excellent ability to focus and stay on task
- Ability to communicate your progress to colleagues

GPU Graphic Processing Unit

The **GPU** team is responsible for technology development and roadmaps for our Mali GPUs. In cooperation with others and GPU stakeholders around Arm, our team develops and maintains an informed view of the long-term directions in graphics technology such as VR/AR, AI, GPU-driven rendering and ray tracing.

We look at why and when we should invest in specific technology improvements based on building end to end views of use-case, software and hardware design.

We work ahead of GPU product development looking at timelines of 2+ years for software and 5+ years for hardware changes.

We work with a combination of tools provided by other groups in Arm, such as C++ model of our GPU and tools developed within our team to aid quick prototyping.

Our team has a broad range of experience from graduates through to those with years of industry experience.

GPU Graphic Processing Unit

What could a placement with us look like?

In the GPU group we develop mainstream processors ranging from high-performance cores to low-power micro-controllers. We have Implementation Teams who build all Arm IP and systems solutions using leading silicon process nodes.

We rely heavily on our internal prototyping tools, and we are always looking at ways to improve them. This could be improving the infrastructure and common codebase or adding support for new graphics features or workflows to simplify future development.

You'll have the opportunity to work closely with other GPU technology specialists in CT but also collaborate with many other teams across Arm such as ecosystem, modelling and performance / profiling teams. Engineers share ideas and contribute to the ideas of others, document and present their work for discussion, review and support the efforts of others, and present their findings impartially and professionally. As an intern, this is something you will be able to be part of.

About you:

For our Software roles: All code we work with is either C/C++ or python based. Knowledge of hardware design is not necessary, but you would ideally be familiar with the Vulkan graphics API and a C++ development tool e.g git and Microsoft Visual Studio

For our Hardware roles: knowledge of HDL (Hardware description language), System Verilog and even FPGA and/or emulation knowledge would be very useful.

On top of that we are looking for people with a real interest in GPU technology and C++ development and is keen to learn and apply their knowledge to develop novel solutions.

ML Machine Learning

The **Machine Learning** Group's role is to develop and execute strategies to grow the business, define the right products and solutions, and ensure our customers are successful.

We develop tooling, software drivers, software libraries, Ahead Of Time (AOT) and Just In Time (JIT) compilers, ML applications, infrastructure and performance analysis to allow users to get the best performance out of Arm's hardware designs when using ML frameworks such as TensorFlow, Caffe and PyTorch.

From research, to proof-of-concept development, to deployment on ARM IPs, joining this team, would be a phenomenal opportunity to contribute to the full life-cycle of machine learning projects and understand how state-of-the-art machine learning is used to solve real word problems.

Working closely with field experts in a truly multi-discipline environment, you will have the chance to explore existing or build new machine learning techniques, while helping unpick the complex world of use-cases that are applied on high end mobile phones, TVs, and laptops.

ML Machine Learning

What could a placement with us look like?

ML candidates can expect to learn about deploying ML workloads across a range of Arm technology including CPUs, GPUs and accelerators. Our teams write a broad spectrum of software from low-level drivers to graph compilers, high-level ML frameworks and application code.

About you:

We are looking for enthusiastic candidates who want the opportunity to develop their existing skills and knowledge whilst working on existing projects within the team. Candidates with an interest in C/C++ or Python would be very relevant to Machine Learning as well as anyone who has had some working experience of machine learning concepts.

In addition, any interest in the following areas would be helpful:

+ DevOps or PyTorch framework
+ Tensorflow software
+ CPU/GPU architecture and memory/ cache concept

OSS Open-Source Software Group

OSS is an active contributor to many open-source projects and initiatives to enable new hardware capabilities and optimize performance on Arm architecture. Our projects span across a large range of domains including:

- **Mobile** (Android, ChromeOS), **Infrastructure & Cloud Computing** (Linux distributions…)
- **Internet of Things (IoT):** Software stack development to enable Arm architecture on Azure, FreeRTOS and Matter (drivers, connectivity, security, Functional Safety…)
- **Operating system development:** Linux kernel; Zephyr, Mbed OS, including big.LITTLE™ and power management, which make Arm a unique CPU architecture.
- **Automotive**: system level software (hypervisor, Embedded Linux, Real-Time OS) for Autonomous driving framework, Critical application monitoring and Security
- **Firmware** and Security Libraries & cryptography (TrustedFirmware, Mbed-TLS…)
- **Runtimes and Just-In-Time compilers** (for Java / JS for Android or servers (OpenJDK), Rust…)
- **Models** of our systems (one or several types of Processors and all the required HW components) before any silicon is available

Our engineers need to understand software development best practices and how the hardware works (not just the processor but the full System on Chip). We call this ‘low level’ or embedded software development.

OSS Open-Source Software Group

What could a placement with us look like?

Because we work with open- source communities such a Linux and Android, our work is very collaborative, both inside and outside Arm. When a new Architectural feature or new processors are developed, we contribute software that enables some new complex features (e.g. Morello Program http://tinyurl.com/2ba8bfbf) or optimizations specific to Arm.

You will have a dedicated mentor to provide you with the technical and practical help. We will treat you like another engineer on the team with your own tasks on the project, having the chance to participate in knowledge sharing, having your ideas heard, solving problems independently and being supported by the rest of the team. And hopefully the opportunity to upstream your code!

About you:

We have a very diverse set of development environments, so we do not have any specific requirements. However, we would ideally like to see candidates with some knowledge of **C, C++, Rust or Python.**

If you have played with Micro:bit, RaspberryPi, Arduino, Mbed boards or a model, these are also good introductions to *Embedded Software*.
If you haven't but you'd be interested, come and learn with us!

PE Productivity Engineering

Productivity Engineering are the part of Arm that helps other parts of the business maximize engineering productivity. We do this by centralizing Arm's common tools, methodologies, and services in a secure, intuitive, and continuously improving engineering experience.

We deliver an improved engineering experience in equal partnership with the rest of Engineering. We work to try and minimize the complexity of IP and improve quality, cost, and time to market.

We help Arm to be more agile in response to customers and standardize efficiency and customer ease of use.

We are looking to help increase the use of Arm technology e.g. EDA, Compute and Cloud so that it is scalable and flexible.

PE Productivity Engineering

What could a placement with us look like?

We have previously sought students in Implementation, verification, emulation, Software testing and software Engineering. All students will be inducted into the team and offered support to develop their existing knowledge, skills set and enthusiasm throughout their placement whilst contributing to projects that we are working on.

About you:

We are looking for candidates with a very real enthusiasm for discovery and development of ideas. We are interested to hear about what you do outside of your university studies and your winder interests in engineering.

We look at candidates for both software focused as well as hardware focused and knowledge and experience in any of the following is likely to be of interest to us:

- Java and Scala
- Javascript,
- Knowledge of hardware acceleration concepts
- Hardware /software interface development

Systems IP Group

The **Systems IP** Team is responsible for developing and delivering a wide range of differentiating technologies and products to internal and external customers. This includes:

- Image Signal Processors (ISP) used to process images captured by sensors in camera systems from security cameras to drones and self-driving cars
- Memory Management Units (MMU). MMUs and Interconnects are responsible for implementing parts of the Arm architecture and provide the backbone that allows all other elements of the System-On-Chip (SoC) to connect to each other and function properly
- Generic Interrupt Controllers (GIC) used to coordinate events across chips and between chips. This includes prioritization as well as virtual machine coordination
- CoreSight Debug and Trace used for in-system tracing accessing chip internals for silicon bring-up and performance monitoring
- Interconnect and Verification IPs (VIPs) VIPs offer critical software tools and components that are used during every Arm hardware development to verify compliance against critical protocol standards that are widely used in the industry.

Products developed by our groups are present in almost every Arm-based chip that gets sold. We are constantly updating our products to keep pace with the performance our customers need and to line up with the latest Arm architecture.

We sell these silicon IP products to most of the big silicon providers worldwide, with products ranging from small internet of things-gadgets, through mobile phones, cars and high-performance servers and network switches.

Systems IP Group

What could a placement with us look like?

Interns in these teams will take on a variety of different tasks to help teams achieve their milestones. These often involve improving and implementing new workflows, investigating new software, helping teams with design and verification of products, and many other tasks which contribute to the success of these projects.

As an intern you will have the opportunity to work on projects using a variety of programming languages and data formats, including System Verilog and Verilog for RTL development, Python for scripting, YAML and JSON for data storage, amongst others which vary across the different projects. You will be given on the job training where required to fulfill any tasks you are given.

About you:

At any given point in time, we have multiple projects in progress across all our product groups. Our interns are assigned to these projects, offering important support to the development teams.

This internship would be suitable for someone who:

- Enjoys being part of a diverse team
- Enjoys writing code to provide elegant solutions to complex problems
- Has an understanding of Hardware Description Language (Verilog / VHDL) for hardware roles
- Has an understanding of Object-Orientated Programming

Systems Development

The **Systems Development** team build compute systems integrating multitude of ARM IPs including CPU, GPU, NPU and system IPs targeting different market domains ranging from mobile phones, IoT devices, data centers and autonomous driving.

The team is responsible for micro-architecting the system based on the requirements and creating the RTL of the system with all IPs integrated ensuring it is high performant and meets the area and power targets. We perform robust verification of the system to guarantee it functions as expected and meets the quality standard expected.

These systems are delivered to external and internal partners through multiple modes:

- Reference system which is aimed at demonstrating how best to integrate ARM IPs and provide guidance to customers to make their own SoCs
- Subsystem Products which are fully verified systems which customers will use within their end products
- Development Platforms which are aimed to showcase the latest ARM technology and enables SW development for new technologies

System development also contains FPGA and boards sub-team responsible for creating FPGA images of the subsyste and perform bring up and testing of ARM development platforms.

Systems Development

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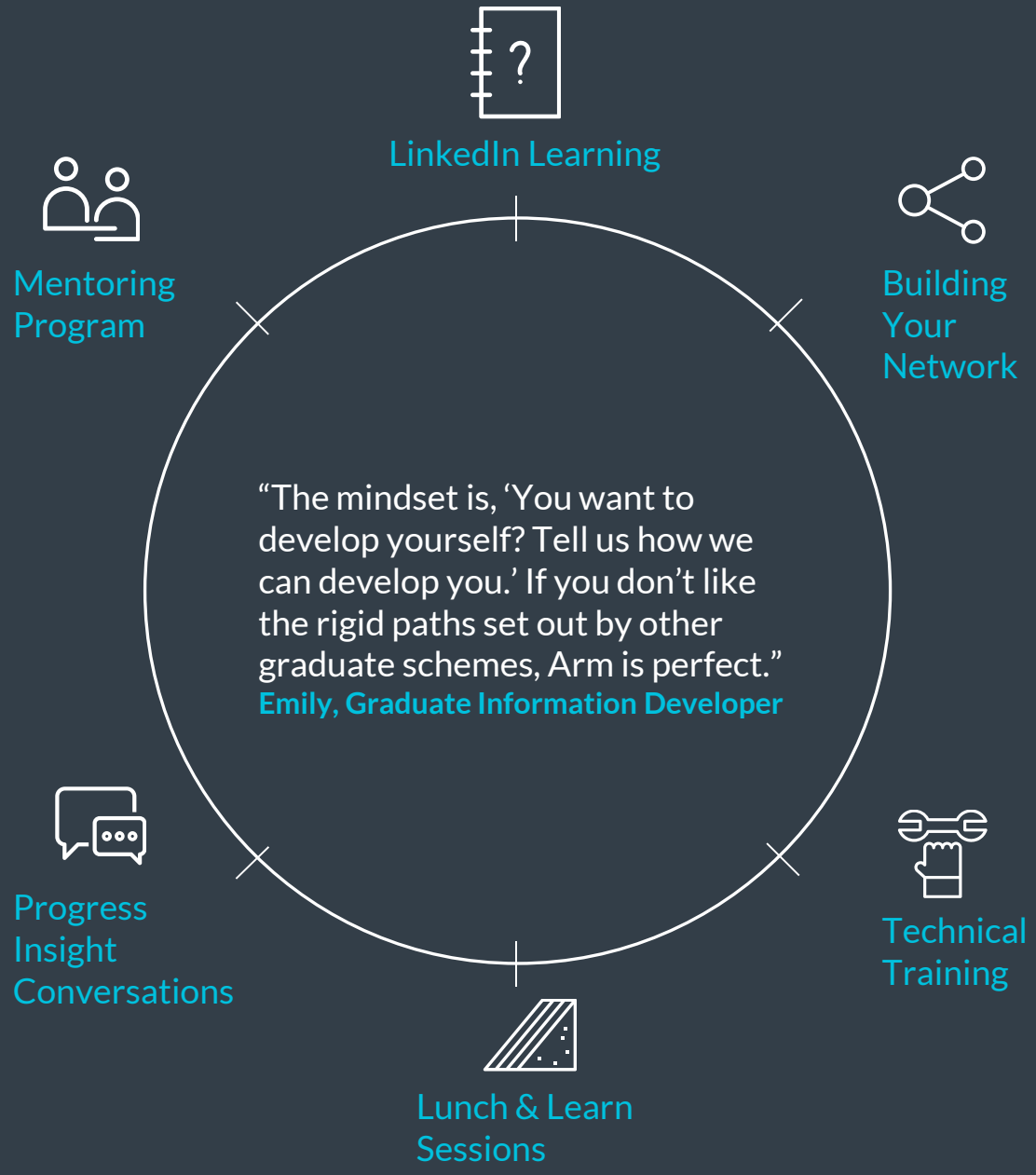
Support at Arm



Rewards & benefits

25 days' holiday

Competitive salary

Comprehensive health care

Support from Early Careers team

"Arm's benefits are world-class. Our health insurance is gold-plated, and vacation is just insane compared to other companies in the US. And then, you get your additional one-month sabbatical every four years!"

Liana, Senior Design Engineer

Remember to let us know about any experience you have that may be relevant to your role when you apply, including programming and coding languages!

- C/C++
- Arduino
- Compiler
- Computer Architecture
- Computer Graphics
- CPU/GPU Architecture
- DevOps
- Embedded Systems
- GIT
- Java
- Javascript
- Machine Learning Frameworks
- Mbed boards
- Memory / Cache concepts
- Micro:bit
- Microsoft Visual Studio
- Object-Orientated Programming
- Open-source Principles
- Python
- Pytorch
- RaspberryPi
- Scala
- Software Programming
- Tensorflow
- Verilog
- Vulkan graphics API

arm

Where to next?

You should have everything you need to apply now, if not you can find out more at careers.arm.com/early-careers