

# MITRE

**Job ID:** 04

**Job Title:** Network Research Engineer  
Summer Intern  
**Organization Name:** MITRE Corporation  
**Clearances:** Top Secret (ability to obtain)  
**Travel:** 10%

**Job Location:** VA: McLean  
**Applicant Type:** Full-Time  
**Minimum GPA:** 3.5  
**Work Authorization:** U.S. Citizen or U.S. National  
**Degree Levels:** BS  
**Major(s):** Computer Science, Electrical Engineering, Computer Engineering, or similar Field

## **Job Highlights:**

Do you want to learn more about networking -- a lot more?

Spend the summer working with a group of engineers who specialize in providing networking expertise on a wide variety of projects. MITRE's Communications Network Engineering and Analysis Department in the Infrastructure and Networking Technical Center seeks a bright, curious, and energetic student who is passionate about communications networks to intern with us this summer. Your activities may include performing design, analysis, prototyping, experimentation, and/or modeling and simulation of various networks. Your specific duties will depend on your skills and experience as well as the project efforts that are underway in May and June. Your activities will be guided by a mentor and designed to take advantage of your existing networking knowledge and experience while also enabling you to gain new skills through exposure to aspects of networking that are still unfamiliar to you. Internships generally last 8-12 weeks during May-August, with specific start and stop dates depending on your school's calendar. Interns will participate in a program of technical and social activities designed to build camaraderie and expose them to what MITRE does across the corporation. Interns will discover why MITRE is such a great place to work and explore possibilities for full-time employment in the future.

## **Key Functions:**

All work will require the intern to make use of his or her fundamental understanding of and interest in networking protocols and principles. To be clear, this is not the type of network engineering position that involves administering, configuring, managing, updating, troubleshooting, or otherwise maintaining a production network to support the work of other analysts. On the contrary, the work may include performing research, analysis, hands-on prototyping, testing, and/or modelling and simulation to address key questions regarding network design and performance that are faced by a variety of MITRE's customers. Specifically, the intern may perform one or more of the following types of activities in support of communications network research:

- Develop and program prototypes in C/C++, Java, or Python
- Build lab-based testbeds and conduct proof-of-concept experiments.
- Develop and execute experiments in a prototype environment
- Evaluate the performance of operational networks, protocols, and experimental systems
- Perform systems-level programming, IP packet processing, and TCP/IP sockets programming.
- Work with Linux and Windows development tools.
- Design and test apps on an Android smartphone

## **Qualifications:**

Interns should be majoring in Computer Science, Electrical Engineering, Information Systems, or a related field and have coursework, experience, or skills as well as a strong interest in some of the following areas:

- Knowledge of TCP/IP, and related standard networking protocols
- Familiarity with emerging networking protocols and concepts such as Software Defined Networking or Network Function Virtualization
- Knowledge of cryptographic protocols and OpenSSL programming
- Knowledge of wireless networks and Layer 2 protocols (e.g., 4G LTE, W-CDMA)
- Familiarity with Firewalls, VPNs, IDSs and other network security technologies
- Familiarity with the configuration of commercial IP routers and Ethernet switches.
- Experience evaluating the performance of communications networks
- Experience developing prototypes or models of communications networks
- Experience with network security analysis
- Familiarity with various commercial and open-source network testing tools.
- Use of Wireshark to analyze traffic flows and troubleshoot network applications
- Familiarity with network performance testing measurement tools and techniques
- Experience with modeling and simulation tools e.g., OPNET/Riverbed, MATLAB, NS-3
- Proficiency with C, C++, Java, Python, and/or Perl
- Linux kernel/module development experience

The intern should also possess the following:

- Excellent written and verbal communication and presentation skills
- Ability to work well in a collaborative team environment
- Be self-motivated to learn new technologies and be flexible to support tasking in a variety of areas
- Ability to obtain/maintain a DoD Top Secret Clearance (U.S. citizenship required)