14 February 2024

Title: Connectivity Modelling Intern

Bureau/Dept/Unit: BDT/DNS/ FNS

Supervision: Head FNS

Duration: 6 to 11 months maximum

Location: ITU Headquarters, Geneva, Switzerland

ITU is the United Nations specialized agency for information and communication technologies – ICTs.

We allocate global radio spectrum and satellite orbits, develop the technical standards that ensure networks and technologies seamlessly interconnect, and strive to improve access to ICTs to underserved communities worldwide.

ITU is committed to connecting all the world's people – wherever they live and whatever their means. Through our work, we protect and support everyone's fundamental right to communicate.

Today, ICTs underpin everything we do. They help manage and control emergency services, water supplies, power networks and food distribution chains. They support health care, education, government services, financial markets, transportation systems, e-commerce platforms and environmental management. And they allow people to communicate with colleagues, friends and family anytime, and almost anywhere.

With the help of our global membership, ITU brings the benefits of modern communication technologies to people everywhere in an efficient, safe, easy and affordable manner.

ITU membership reads like a Who's Who of the ICT sector. We're unique among UN agencies in having both public and private sector membership. So in addition to our 193 Member States, ITU membership includes ICT regulators, many leading academic institutions and some 700 tech companies.

In an increasingly interconnected world, ITU is the single global organization embracing all players in this dynamic and fast-growing sector.

1. **Organizational Unit**:

The Telecommunication Development Bureau (BDT) is responsible for the organization and coordination of the work of the Telecommunication Development Sector (ITU-D) of the Union which deals mainly with ICT-focused development policies, strategies and programmes, as well as technical cooperation activities, to promote digital inclusion and drive digital transformation at community, country and regional levels. To effectively and efficiently serve the needs of ITU members, BDT is organized into four functional areas:

- Office of the Deputy to the Director and Field Operations Coordination Department

- Partnerships for Digital Development Department

- Digital Networks & Society Department

- Digital Knowledge Hub Department

The Digital Networks & Society Department (DNS) is responsible for BDT activities in the areas of spectrum management, network development, cybersecurity and emergency telecommunications. This department is also responsible for supporting ITU Member States in their transition to digital societies by providing tools and guidelines to address environmental challenges (in particular, climate change and e-waste), and for promoting innovation, ICT applications/services, digital inclusion and ecosystems, with the ultimate goal to 'leave no one behind'.

|  |
| --- |
| 1. **Organizational context:** (Describe the organizational setting of the post and the purpose of the post as well as any supervision given or received)   The intern will work in the Future Networks and Spectrum Management Division (FNS) at the Digital Networks and Society DNS) Department and will support the work of the Network and Infrastructure Thematic Priority.  The objective of the program is to assist ITU Member States and ITU-D Sector Members and Associates in maximizing the use of new technologies for the development of their information and communication infrastructures and services and building global telecommunication/ICT infrastructure. It will be reached through: Increased usage of **connectivity**by citizens for socio-economic activities; efficient **spectrum management**by professionals using advanced technics and adoption of modern **ICT infrastructure,** based on **international ICT standards** by governmental bodies. The intern will be closely supervised by the Head of the Division. |

## **Terms of Reference / Internship Objective:**

The intern will support the division by creating and implementing mathematical models for telecommunication networks, tailored to connectivity scenarios relevant to infrastructure development project planning. These models should cover fiber optic networks, mobile cellular communications, fixed wireless access, and satellite communications, with a primary focus on distance, capacity constraints, resource allocation, and economic efficiency considerations.

Under the supervision of the Future Networks and Spectrum Management Division (FNS) and in collaboration with the FNS team members, the intern will:

1. Conduct research and establish a database of parameters and constraints for major telecommunication technologies.

2. Assist in the creation of abstract models of these technologies for use in infrastructure development planning.

**Competencies**

**Technical Competencies** Understanding of research principles.

1. Understanding of research principles.
2. Basic experience in data collection and processing.
3. Critical thinking skills. Software development experience with Python.
4. Familiarity with information theory and optimization problems would be a plus.
5. **Qualifications required**
6. **Education**:

Bachelor's, Master's, and Ph.D. students, or recent graduates (no more than 6 months after graduation), in areas related to information and communication technologies, computer science, applied mathematics, or physics, are eligible. Candidates with other university degrees will be considered based on the relevance of their studies to the research areas.

1. **Work experience**:

No work experience is required.

1. **Languages:**Good knowledge of English for conducting research as well as for drafting and editing documents. Knowledge of one of the other five official languages of the Union (Arabic, Chinese, French, Russian, Spanish) would be an advantage.
2. **Training and Learning Elements:**

The intern will acquire excellent knowledge and experience of:

* Applying ICT infrastructure business planning methodologies.
* Implementing and executing connectivity models for different technologies and scenarios.
* Conducting research on the implementation of projects focusing on last-mile connectivity globally. Utilizing open-source data and GIS in the planning of telecommunication network development.
* Engaging in communication and work processes within an international environment.