



Tutorial

1. 제 목 : Threats to GNSS and GNSS Integrity Verification

2. 연 사 : Dr. Sam Pullen

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Department of Aeronautics and Astronautics
Stanford University, USA

3. 일 시 : 2017년 7월 10-11일 (Monday and Tuesday)

4. 장 소 : 서울대학교 정밀기계설계공동연구소 313동 224호

5. 내 용 : This series of tutorials consists of three separate presentations:

Monday 9:00 AM – 12:00 PM: GNSS Vulnerabilities: Threats and Failure Modes

This presentation provides an overview of the threats to safe, reliable, and continuous use of GNSS. These threats are divided into four classes: GNSS satellite and control segment failures, atmospheric anomalies (ionospheric and tropospheric), local environmental anomalies (e.g., unusual multipath), and RF jamming and spoofing. The threat posed by each vulnerability to integrity, continuity, and availability will be described. Several examples of specific anomalies that have occurred will be discussed along with lessons learned from them.

Monday 1:30 PM – 5:30 PM: Reliability of GNSS Positioning

This presentation describes how the reliability and safety of GNSS positioning is assessed and protected for both standalone and augmented users. The reliability of GNSS navigation will be defined in the standard terms of accuracy, integrity, continuity, and availability, and the impact of each of these performance characteristics on safe and trustworthy navigation will be explained. The concept of protection levels calculated by users to bound GNSS errors to small probabilities will be described along the algorithms and monitors required to support and generate protection these levels in the presence of the threats and failure models described in the previous presentation.

Tuesday 9:00 AM – 12:00 PM: SBAS and GBAS Overview

This presentation provides an overview of the design of Satellite-based and Ground-based Augmentation Systems (SBAS and GBAS) that support GPS and (in the future) other GNSS satellite systems. The focus is on the means by which SBAS and GBAS provide enhanced accuracy and integrity to GNSS users and the technical differences between these two approaches to GNSS augmentation. Time will be left over for general question and answer (Q&A) and discussion regarding all three presentations.

6. 약 력 :

5/99 – present: Senior Research Engineer, Stanford University

6/96 – 4/99: Research Engineer, Stanford University

1/96 – present: Principal of Sam Pullen Consulting

6/96: Ph.D. Aeronautics and Astronautics, Stanford University

6/90: M.S. Aeronautics and Astronautics, Stanford University

6/89: S.B. Aeronautics and Astronautics, Massachusetts Institute of Technology

7. 문 의 : 기계항공공학부 기창돈 교수 (☎ 02-880-1912)

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서울대학교 우주교육시스템구축사업