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2024 Local Chapter Activity Report

Prof. Kamel BESBES

Unisec Tunisia

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University Space Engineering Consortium

Presentation plan

- UNISIEC Tunisia presentation
- Promoting courses on space and satellite technologies
- Development of Cubesat Fabrication and Test facilities
- 3rd SPACE STAR conference, November 2024
- International Events

What is UNISIEC Tunisia?

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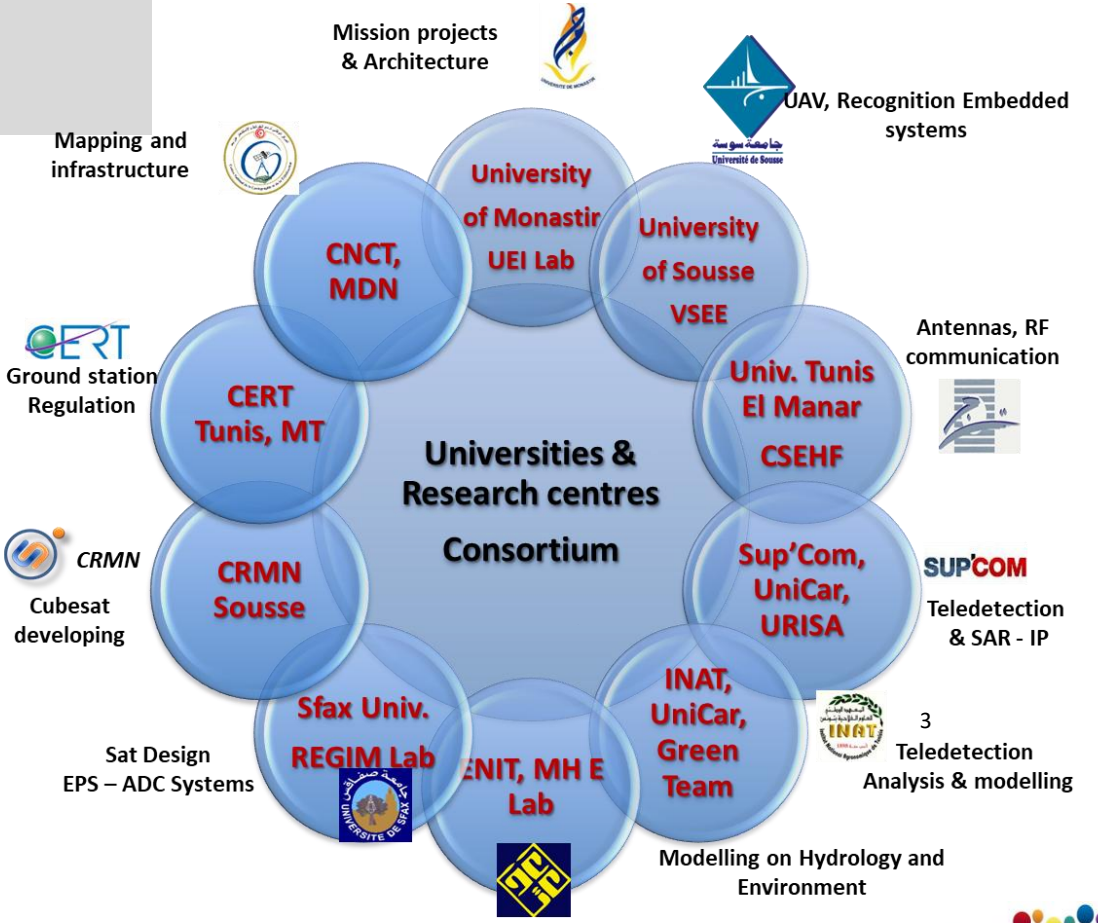
Unisec Tunisia launched Since Dec-2013,
Objectives:

- ✓ Promotion of National and International projects
- ✓ Working on Fundraising and Project Support
- ✓ Promotion of the alliance
- ✓ Organization of events
- ✓ Communication and dissemination
- ✓ Promotion of International Cooperation



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Please put logo of your Local Chapter into the slide master.

New partners

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Promoting courses on space and satellite technologies

- Trends on space technologies
- Big Bang & Space environments
- Space mechanics
- Satellite engineering methods
- Satellite communication
- Space positioning systems GNSS
- Earth Observation & remote sensing

Development of Cubesat Fabrication and Test facilities

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PAQ-PromESSE
COLLABORA
FACT

Enova ROBOTICS
CRMN

Fabrication & Application of CubeSats in Tunisia

- Researchers: 9
- Engineers: 3
- Grad Students: 13
- Undergrad Students: 15

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FACT: CubeSat Cleanroom Mounting Facility

Main Specifications:

- ISO 6 /Class 1000
- Work zone ($12m^2$): 3m x 4m x 2.4m
- Modular, transportable Hard Walls in plexiglass (5mm)
- Self-supporting epoxy-painted metallic Frame
- Metallic, epoxy-painted ceiling
- 4 Fan Filter Units (FFU) composed of HEPA Filters, pre-filters, and 3 fan speeds
- ESD Floor
- Anti-dust LED Lights

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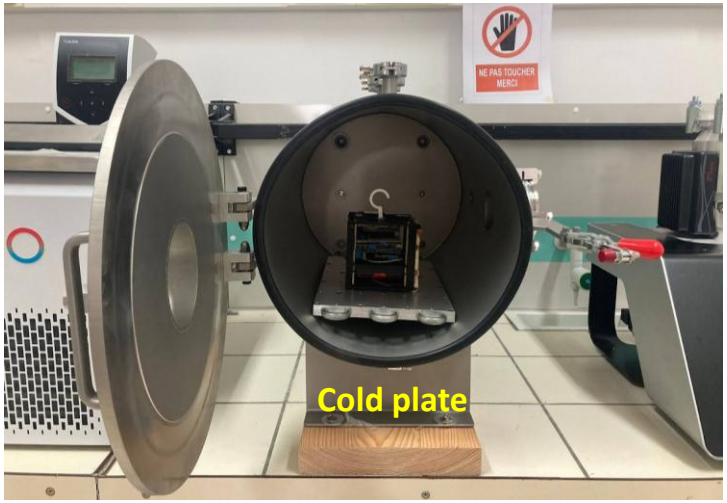
FACT : CubeSat Thermal testing Facility

Thermal vacuum testing chamber:

- Shape: Stainless steel Cylinder
- Size: 30cm x 45cm (can test from a 1U up to 6U CubeSats)
- Temperature range: -20C to +50C
- Temperature change rate: ±1C per minute
- Vacuum pressure: 10^{-4} Pa



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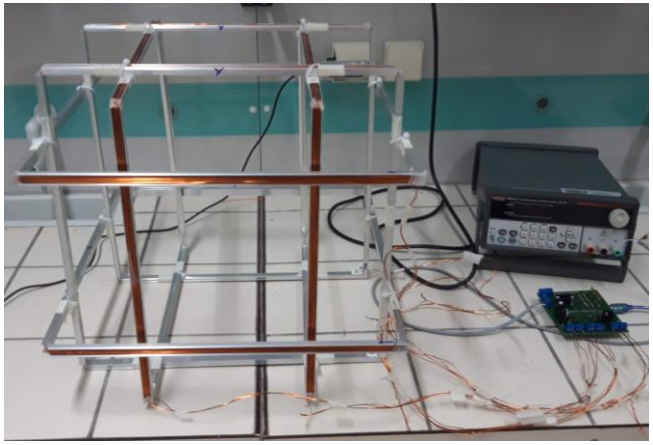
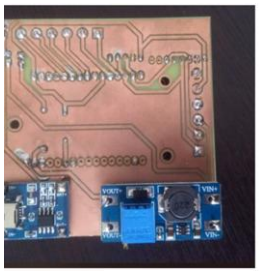
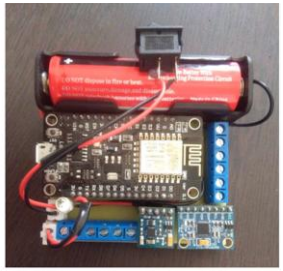
FACT : MAGNETIC Testing Facilities

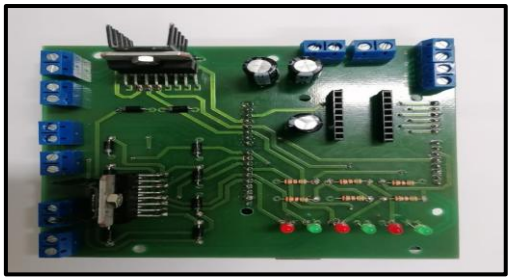
- **Helmholtz Cage: Earth magnetic field emulation**
  - **Dimensions: 45cm x 45cm x 45cm: 1U CubeSat testing**
  - **Aluminum frame**
  - **Magnetic field strength: ±100µT on each axis**
  - **Precise magnetic field control through the GUI**



- ADCS : Attitude acquisition System with wireless data transmission, autonomous power, and GUI:
  - Three-axis magnetometer
  - Three-axis gyroscope
  - Three-axis accelerometer
  - WiFi data transmission to GUI







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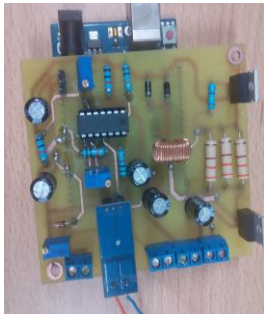
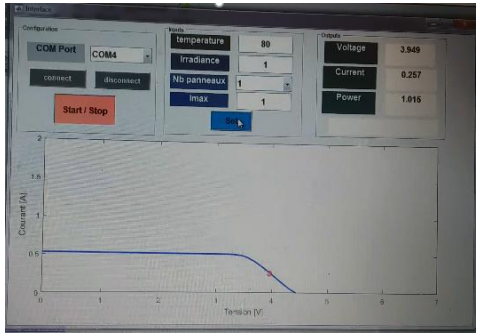
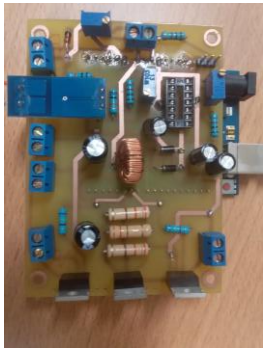
FACT : Electrical Power System Testing platform

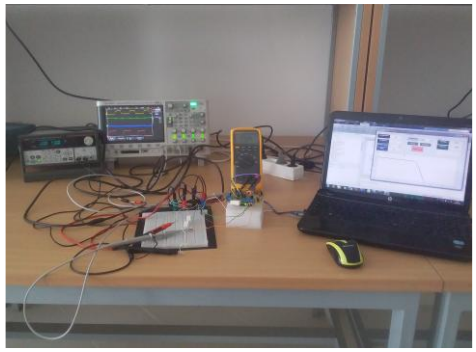
- Solar panel simulator
  - Generates power based on Solar radiation, Temperature and number of cells
  - Respects solar panel I-V curves
  - Outputs: Panel voltage, current, and power
  - Can be used to simulate different illumination scenarios
  - Controlled through a GUI

- Battery simulator:
  - Automatically detects functioning mode: Charging/Discharging
  - Respects battery Charging/Discharging curves
  - Outputs battery voltage, current, and capacity
  - Can be used to simulate different power scenarios
  - Controlled through a GUI









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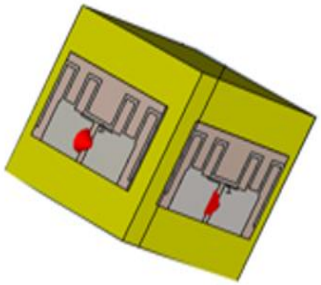
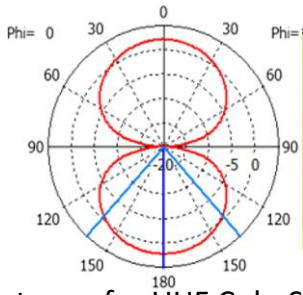
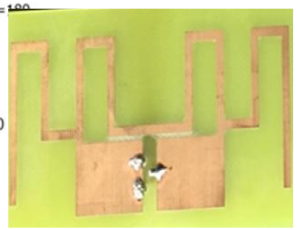
FACT-CRMN : RF Testing Facilities



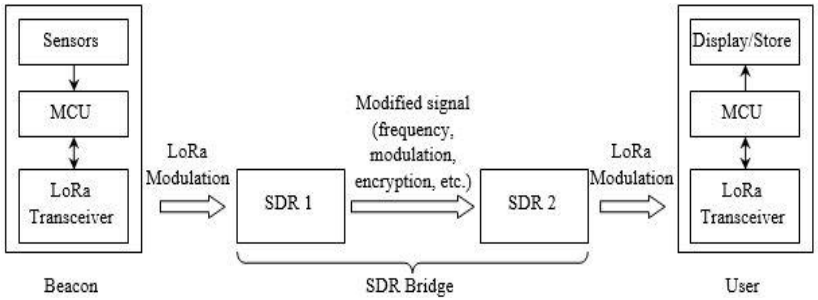




Planar meander line antenna for UHF CubeSat communication: 430MHz, 920 MHz, 5,75GHz

SDR based communication CubeSat system

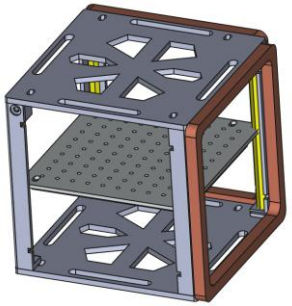
- Receives signals from multiple transmitters working with different frequencies and modulations.
- Stores the received data onboard
- Forwards the data to a ground station

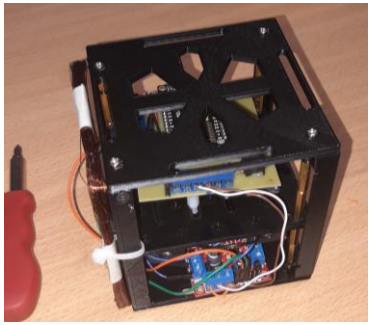


Hassayoun, S., Lahouar, S., Besbes, K.: SDR Bridge for a Secure Wireless Sensor Network (WSN), Proceedings of 2020 IEEE International Conference on Design & Test of Integrated Micro & Nano-Systems, June 2020, Salem Hassayoun, ENIM 2020, PhD thesis

Mechanical and 3D prototyping facilities

- Objectives:
  - Test the different subsystems of the CubeSat
  - Ensure their correct operation
- 1U CubeSat mechanical structure prototype designed in-house
- Fabricated with a 3D printer
- Can hold commercial or in-house made subsystems





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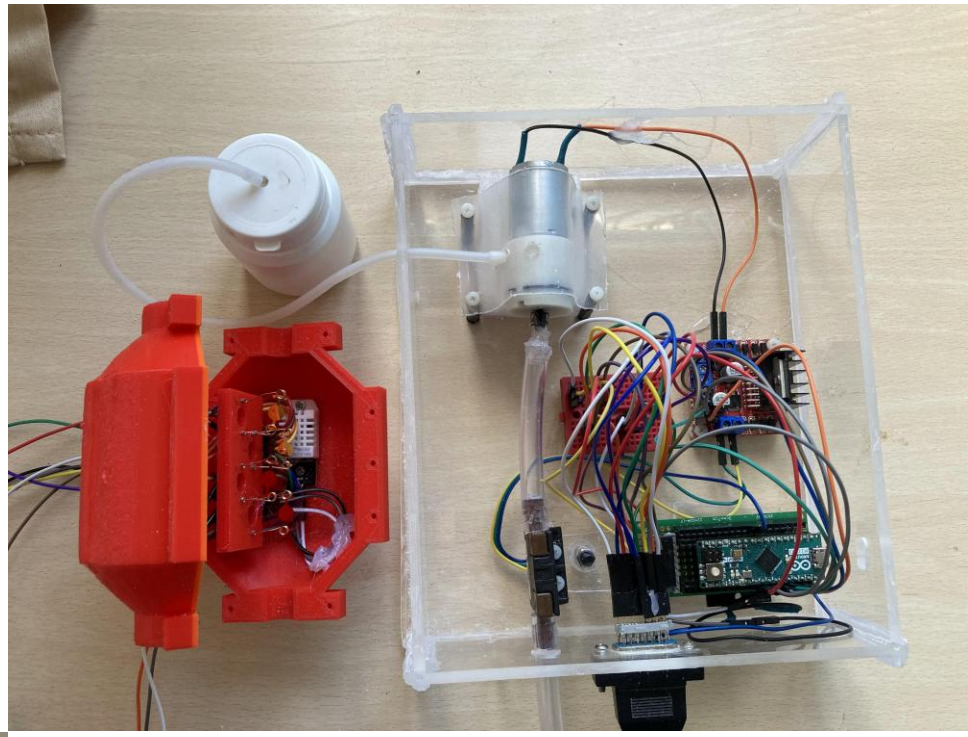
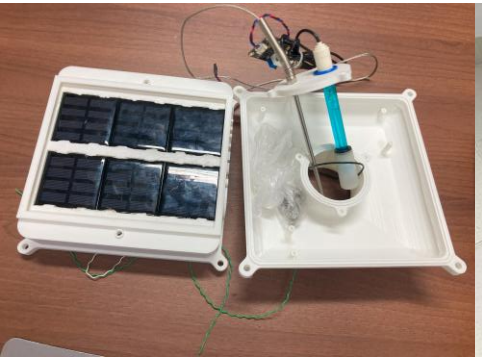
Ground Segment for Space IoT :

Gases and Water quality ,
Earth Observation,
MultiGNSS





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Launchable CubeSat platform

Final cubesat development :

- Under test and acceptance
- Ready for programming
- To be launched

The 1U platform includes:

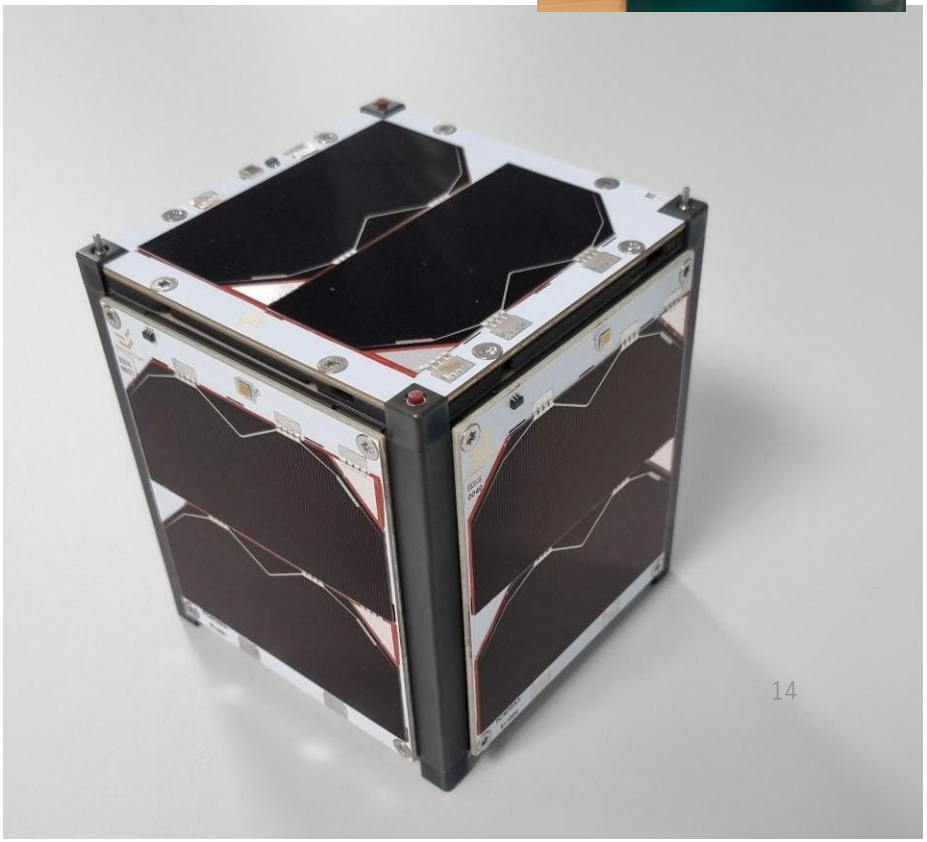
- Aluminum Structure
- Onboard-Computer
- Electrical Power System (Solar panels, batteries, and power distribution)
- Attitude Determination and Control System
- UHF Communication System (435MHz to 436MHz)

Payloads:

- SDR based communication system
- Gaz sensors …
- Patch antenna

Space technology team

- Researchers: 9
- Engineers: 3
- Grad Students: 10
- Undergrad Students: 11



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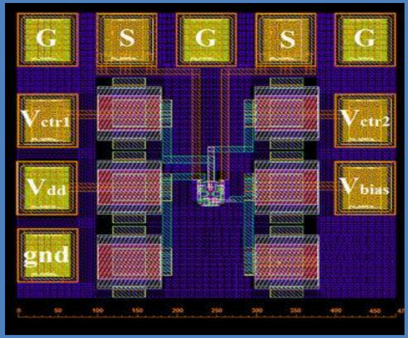

A 160-μW, Ring Digitally Controlled Oscillator for UHF/VHF Nano-satellites Broadcasting Tuners in 90nm CMOS Process

Authors: Sehmi Saad, Mongia Mhiri, Aymen Ben Hammadi, Kamel Besbes

Microelectronic and Instrumentation Lab, LR-13ES12, FSM, University of Monastir, Tunisia

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Journal of Circuits, Systems and Computers | Vol. 26, No. 04, 1750055 (2017)

An Enhanced Design of Multi-Band RF Band Pass Filter Based on Tunable High-Q Active Inductor for Nano-Satellite Applications

Aymen Ben Hammadi, Mongia Mhiri, Fayrouz Haddad, Sehmi Saad and Kamel Besbes

DOI: 10.1109/IDT.2016.7843051 • Corpus ID: 23242997

An L, S and S2 bands, compliant LC-based DCO for amateur Nano-satellite applications

S. Saad, M. Mhiri, +1 author K. Besbes • Published 2016 • Materials Science, Computer Science • 2016 11th International Design & Test Symposium (IDT)

This paper presents a LC-based digitally controlled oscillator (DCO) with an enhanced frequency resolution and an extended linear frequency tuning range. It generates frequencies between 1.22 and 3.52 GHz that covers three main bands defined for amateur Nano-satellite applications (L, S and S2). The DCO exploits a new tunable active inductor (TAI) that achieves a high Q-factor with a maximum value of 98 over a frequency range of 1770 MHz. It tunes from 3.55 nH to 15.2 nH. Furthermore, a tuning circuitry based on a capacitive degeneration network formed by a capacitance with an additional resistance, is employed to achieve a low frequency resolution without any dithering. The achieved frequency resolution is approximately between 3 and 16 kHz. The DCO exhibits a phase noise of −105.8 dBc/Hz at 1MHz frequency offset and an FoM of −175 dBc/Hz. Finally, the circuit consumes 5.2 mA current when is designed in a 90-nm nine-metal CMOS technology with an operating supply voltage of 1.0 V.

2016 11th International Design & Test Symposium (IDT)

An L, S and S2 bands, compliant LC-based DCO for Amateur Nano-Satellite Applications

Sehmi Saad[1], Mongia Mhiri[1], Aymen Ben Hammadi[1] and Kamel Besbes[1,2]

[1]Microelectronic and Instrumentation Laboratory, LR-13ES12, University of Monastir, Tunisia

[2]Center for Research in Microelectronics and Nanotechnology (CRMN), Techno-park of Sousse, Tunisia

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Constellation of Pico-Satellites for 3D Earth observation

NissenLAZREG[1], Kamel BESBES[1,2]

[1]Microelectronics & Instrumentation Lab; Faculty of Sciences of Monastir; University of Monastir, Tunisia

[2]Centre for Research in Microelectronic & Nanotechnology (CRMN), Technopark Sousse, Tunisia

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Advances in Space Research

Volume 61, Issue 4, 15 February 2018, Pages 1017-1024

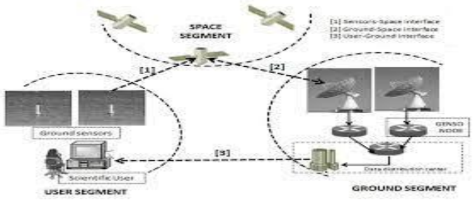
Analysis and design of Cubesat constellation for the Mediterranean south costal monitoring against illegal immigration

Nissen Lazreg[a], Omar Ben Bahri[a], Kamel Besbes[a, b]

Small Satellite and Multi-Sensor Network for Real Time Control and Analysis of Lakes Surface Waters

Nader Gallah, Microelectronics & Instrumentation Lab, University of Monastir, Monastir, Tunisia, Nader_92809015@hotmail.fr

Kamel Besbes, Microelectronics & Instrumentation Lab, University of Monastir, Monastir, Tunisia, kamel.besbes@fsm.rnu.tn



(IJACSA) International Journal of Advanced Computer Science and Applications, Vol. 8, No. 3, 2017

Water Quality Monitoring based on Small Satellite Technology

N. Gallah[1], O. b. Bahri[1], N. Lazreg[1], A. Chaouch[1]

[1]Microelectronic and Instrumentation Lab

[1]Faculty of sciences, University of Monastir

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Kamel Besbes[1,2]

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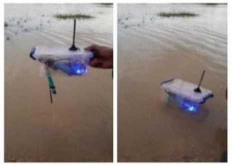

Prototype of the system with microcontroller board, sensors and SDR module

Fig. 1. Satellite earth observation. (a) NASA project (Courtesy of NASA[1]). (b) ESA project (image by ESA/ATG medialab[2])

However, the satellite earth observation systems present always gaps. The earth observation methods used for water quality monitoring are based on sensors resolution. Indeed,

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Advances in Space Research

Volume 61, Issue 6, 15 March 2018, Pages 1501-1511

Didactic satellite based on Android platform for space operation demonstration and development

Omar Ben Bahri[a], Kamel Besbes[a, b]

Smartphone-Based Telemedicine Supported by Pico-Satellite Constellation

Omar Ben Bahri, Nissen Lazreg & Kamel Besbes

Pages 726-735 | Published online: 20 Mar 2018

Download citation https://doi.org/10.1080/03772063.2018.1438212 Check for updates

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ABSTRACT

Many people in developing countries are required to travel for several hours to see a doctor. The concept of so called telemedicine accompanied with developments in the field of wireless communications may improve the health care. Here presented telemedicine system is for a distance consultation. It is based on a pocket smartphone using its camera to develop a video broadcasting mission for a real-time consultation. However, developing countries in the Middle East and North Africa suffer network coverage in most areas. To overcome this issue, the system includes a software defined radio in order to integrate the small satellite technology in the telemedicine routine. The proposed pico-satellite constellation can provide an interesting solution for near real-time transmission, which will significantly improve the health care in remote areas.

KEYWORDS: Constellation MENA Pico-satellite SDR Smart system Telemedicine

ICEMIS2017, Monastir, Tunisia

Registration and correction techniques in Cubesat remote sensing images

Nissen Lazreg[1], Rochdi bouchiha[1], Kamel Besbes[1,2]

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[2]Centre for Research in Microelectronic & Nanotechnology (CRMN), Technopark Sousse, Tunisia

lazreg.nissen@yahoo.fr, rochdi.bouchiha@gmail.com, kamel.besbes@fsm.rnu.tn

Abstract— Under the cover of the earth, the high-altitude orbits and geostationary orbits provide high temporal resolution but remain poor in terms of spatial resolution. Image registration is a fundamental task in image processing used to match two or more images which are taken at different time, from different sensors or different viewpoints Also, this type of task can obviously meet the demand of the high spatial resolution at low altitude view but a high number of spacecraft. This paper investigates the positioning accuracy of image. We propose a new feature-based approach to detect changes between a pair of tow images taken from different Cubesats or from one Cubesat but in different incidence angle in different time. This approach is based on the SIFT algorithm. It can deal with multi-resolutions, multi-sensors and multi-incidence angles situations, and it offers promising results.

Keywords— Cubesat; Image registration; Photogrammetry; SIFT.

Remote sensing using Cubesat which allows direct data downlink to various small ground stations, eliminates the need for a centralized processing and distribution system while yet providing the advantages of real-time access to the observations concerned; small size databases and easy

information distribution within areas not well served by communications systems. Furthermore, this is very important for disaster prevention: earthquake forecasts, early detection of tropical storms and predictions of volcanic activity.

Earth Observation missions usually require that the same area on earth is likely to be imaged every certain amount of time and this is achieved by implementing repeating ground track orbits.

Several satellite-based imaging systems can quickly acquire images at different view angles. These include the Multispectral Thermal Imager (MTI) [3, 4], IKONOS [5],

Autonomous and In-situ Water Quality Monitoring System for Real-World Applications

Nader Gallah, Omar Ben Bahri, Zied Gafsi and Kamel Besbes

Microelectronics & instrumentation Labs, University of Monastir, Monastir, Tunisia

Email: kamel.besbes@fsm.rnu.tn

Abstract—In order to improve the routine of water quality monitoring and reduce the risk of accidental or deliberate contaminations, this paper presents, the development of low cost and durable on-line water quality system includes multi-parameter sensors, acquisition card, communication system and another accessories. These sensors can be installed across water distribution networks within an interface to control the continuous flow and pressure of the large volume water samples (rivers, lakes). The flow water is made through a channel which is designed on one side of this interface. In our system, we propose to use the small satellite technology offered by the international spatial project such as HumSat. Data collected by various sensors such as temperature, pH, and turbidity are sent via bluetooth to bluetooth-UHF Bridge which is equipped with a Bluetooth module, memory, microcontroller, modulator, transceiver and UHF antenna. The bridge is responsible for the satellite communication. A novel WSN architecture was proposed.

Index Terms—flow channel interface, autonomous, on-line water monitoring, sensor networks.

I. INTRODUCTION

Surface water quality monitoring is one of the most important activities in environment monitoring domain. The number of scientific research and development systems in this area is extremely large.

The MENA region is projected to experience an increase of 3°C to 5°C in mean temperature and 20% decline in precipitation by the end of this century (IPCC, 2007). The consequence of this climate change on water run-off is es-

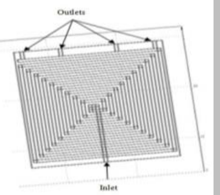

Fig. 1. Schematic of the channel designed

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Promoting national scientific events

Nov 2013

UNISEC Tunisia

March 2014

MICST 2014

mars 2018

Conf :Tunisian Space Strategy

Apr. 2020

RNT SAMA Tunisia

Oct 2022

Spacestar'22

Oct 2023

Spacesatr'23

November 2024

Spacestar'24

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University Space Engineering Consortium

The third edition of SPACE STAR Conference will be organized at INAT, and it will focus on :

"The Role of Space Tools in Addressing the Challenges of Emerging Countries in Bridging SDG Gaps."

SPACESTAR'24 will provide a platform for interdisciplinary discussions, knowledge exchange, and collaboration, aiming to advance space usage in emerging countries and beyond.

The conference covers the following space related topics:

- **Space Science and Exploration**
- **Space Technology and Engineering**
- **Space Applications and Utilization**
- **Space Policy, Law, and Governance**

Partners & Sponsors

Mapping of Carthage city. It was world's largest and prosperous cities with extensive fertile lands and major marine trade ways.

Wednesday, November 13, 2024 Space Applications and Earth Observation			
8:00 to 8:30	Registration, INAT Conference Hall		
8:30 to 9:20	Opening Ceremony Official opening: Minister of Agriculture, Water Resources and Fisheries, Tunisia / President of IRESA / INAT General Director		
9:20 -9:50	Conference Session (1): Water resources under the eye of satellites Dr Mehrez ZRIBI, OMP Director, Observatoire de Midi-Pyrénées, France		
9:50 11:10	Oral Communication (1): Remote Sensing and Data Processing		Chair : Prof Zohra LILI CHABAANE
	EO-001	Z. KASSOUK, F. MAGHREBI , V. SIMONEAUX, A. C. BELLAKANJI, V. LEDANTEC, Z. LILI CHABAANE - INAT-Green Team-Tunisia	Application of high spatial and temporal resolution remote sensing data to map cropping practices in Merguellil plain (Sentinel-2/VENμS synergy)
	EO-002	K NEILI, F TRABELSI, S JIWA, A AGHA KOUCHAK ESIM-Tunisia	A Hybrid Approach to Groundwater Level Forecasting: Integrating Earth Observation and Machine Learning in the Medjerda Basin (Tunisia)
	EO-003	M BARBOUCHI, E GHARBIA, W TOUKEBRI, H BOUSNINA, M ANNABI, H BAHRI, INAT-Tunisia	Mapping and predicting land use change using remote sensing data: case study of Zaghouan
	EO-004	S BEN MAHMOUD, C OLFA,C MASMOUDI, A BOUCHKARA, ENIG-Tunisia	Classification of Time Series Sentinel-1 Images Using Convolutional Neural Networks
11:10 to 11:30	Coffee Break		
11:30 to 12:50	Oral Communication (2): Earth Observation and Water Management		Chair: Prof Mehdi BEN MIMOUN
	EO-005	A CHAHBI, M DRIDI, Z KASSOUK, Z LILI CHABAANE, INAT-Green Team- Tunisia	Identification of flood-vulnerable areas in the Nabeul region by optical and radar remote sensing
	EO-006	S. PILIA, G. FONTANELLI, F. BARONI, S. PALOSCIA, S. PETTINATO, G. RAMAT, E. SANTI, L. SANTURRI IFAC – CNR, Italy	Synergy between optical and microwave satellite data to identify agricultural vegetation parameters and soil humidity in arid zones in Tuscany (Italy)
	EO-007	M KHLIF, A CHAHBI BELLAKANJI, M J ESCORIHUELA, G S ALCALDE, Z LILI CHABAANE, INAT Green Team- Italy	Early Estimation and Spatial Modeling of Cereal Yields and Water Productivity in Semi-Arid Region Using Machine Learning and Satellite-Based Drought Indices
	EO-008	Y GACHAA, T ABDELLATIF, STD-MRC-SERCOM-Tunisia	Water Loss Detection and Mapping System Using Deep Learning and Big Data
12:50 to 14:15	Lunch		
14:15 to 14:35	Conference Session (2) : Cartographie des emblavures céréalières par télédétection en Tunisie centrale et mesures d'adaptation dans la gestion de l'eau en agriculture Prof Zohra Lili Chabaane, President IRESA		
14:35 to 15:00	Conference Session (3) : EO Based on the Thermal Infrared Anisotropy Measurements : The TRISHNA MISSION Jean Louis ROUJEAN, Directeur de Recherche CNRS, Toulouse, France		
15:00 to 16:20	Oral Communication (3): Remote Sensing, Mapping and Management		Chair: Prof Olfa CHARFI MARRAKCHI
	EO-009	G GRAJA, T ABDELLATIF STD-MRC-SERCOM-Tunisia	UAV-Satellite data integration for forestry
	EO-010	W TALHAOUI, CNCT Tunisia	Remote sensing for geological mapping and mineral resources inventory
	EO-011	K MANSOUR, H ABDERRAHMEN CNCT Tunisia	Big geospatial data for smart and sustainable cities
	EO-012	A EZZINE, CNCT Tunisia	Modélisation et cartographie du risque de l'érosion hydrique par l'application des techniques géospatiales
16:20 to 16:50	Coffee Break		
16:50 to 17:50	Oral Communication (4): Remote Sensing Infrastructure and Applications		Chair: Dr Zeineb KASSOUK
	EO-013	H TRABELSI, CNCT Tunisia	Estimation des propriétés des sols par l'utilisation de la télédétection et les données spectroscopiques
	EO-014	H ISMAIL CNCT-Tunisia	Infrastructure nationale d'information géographique (inig)
	EO-015	T SAHLI CHAHED CNCT Tunisia	Rôle de la recherche et la valorisation des resultats dans le développement des techniques de télédétection dans le domaine de la gestion, protection et aménagement du territoire
	EO-016	M Ali BRIKI, K BEN HOUIDI, APAL Tunisia	Satellite Observation of Coastal Changes in Tunisia: Addressing Sustainable Development Challenges and Marine Biodiversity Coastal

Thursday, November 14, 2024 Space Science and Technology			
09:00 to 9:30	Conference Sessions (4): Leveraging the Opportunities of Satellite Navigation for the African Continental Agenda- A Priority sectors based approach, Dr Aicha ALOU, SatNav-Africa Joint Programme Office, Senegal		
9:30 to 10:30	Oral Communication (5): GNSS and Space Signal Instrumentation		Chair: Prof. Mounir MANSOUR
	ST-001	Alex WANDA, Herbert NGAYA, SATNAV-JPO, Senegal	Bridging gaps in the provision of high accuracy positioning services on the African Continent with Galileo High Accuracy Service (HAS)
	ST-002	Noha FATHY, NSST Egypt	Satellite electricity transmission from space to earth
	ST-003	Feten OUAJA, RZIGA, Kamel BESBES FSM-CRMN - Tunisia	Space quantum gravimetry
10:30 to 10:50	Coffee Break		
10:50 -11:50	Oral Communication (6): Space Technology Nanosatellite Design and Testing		Chair : Prof Kamel BESBES
	ST-004	S LAHOUAR, M MANSOUR, K. BESBES, Uei-CRMN Tunisie	Low-cost thermal vacuum testing setup for CubeSats
	ST-005	M MANSOUR, S LAHOUAR, K BESBES, Uei-CRMN Tunisie	Attitude Determination of a CubeSat Based on Multi-sensor Data Fusion
	ST-006	N ZELFANI, S LAHOUAR, K BESBES, Uei-CRMN Tunisie	Patch antenna design for nanosatellite communication
12:00 to 12:40	Conference Session (5) New challenges on space exploration: Lunar Environment Monitoring Dr Mehdi BENNA , NASA & UNIVERSITY OF MARYLAND BALTIMORE, NASA, USA		
12:40 to 14:00	Lunch		
14:00 -14:30	Conference Session (6): State of the art on transforming Space communication Dr Walid MATHLOUTHI, Head of the Future Networks and Spectrum Management division, ITU, Switzerland		
14:40 to 15:40	Oral Communication (7): Space Engineering development		Chair : Prof. Ahmed SIALA
	ST-007	BENDJEDID R, SANOUSSI, T TCHANGOLE, O BENJELLOUN, EU Fez, Morocco	The Atom: A Solution For The Fight Against Climate Change
	ST-008	S SNOUSSI, I TITOUHI, A HAMMAMI, I ALBOUCHI, CST Tunisie	TUNSat1, Educational and space promotion program
	ST-009	S SNOUSSI, I TITOUHI, A HAMMAMI, I ALBOUCHI, CST-Tunisie	CST activities in the field of Space and Astronomy
16:10 to 16:30	Coffee Break		
16:30 to 17:30	Oral Communication (8): SPACE and SDG		Chair : Prof. Imed Riadh FARAH
	ST-010	R BEN MOUSSA, T S.DIAS,S PALIT, S HAZRA, FLT ElMenar-Tunisie	Space as a Global Commons to Attain the UN Agenda 2030: An African Perspective
	ST-011	H.BALTI, A.BEN ABBES, M.RHIF, F.CHOUIKHI, M.FARAH, I.R. FARAH, MSE Tunisie	SmartSDGTunisia: An AI and Remote Sensing Framework for Advancing SDG in Tunisia
	ST-012	R BEN MOUSSA, O JOUINI, FLT El Menar-Tunisie	Bridging Digital Divides: Addressing Regulatory Gaps in Satellite Internet Integration for Sustainable Development in Tunisia
17:30 to 18:00	Conference Session (7) : HERA asteroid mission for planetary defence program, Rania TOUKABRI, Satellite and launcher systems architect, ESA		

Friday, November 15, 2024 Space Regulations and Policies, Conference Co- Chair: Prof. Refaat CHAABOUNI	
ARTIFICIAL INTELLIGENCE AND SPACE	
09:00 to 9:20	Key Note 1 : AI to the Rescue: Enhancing Disaster Warnings with Tech Tools Dr Bilel JAMOUSSI, and Dr Monique Kuglitsch, ITU Switzerland
09:20 to 9:40	Key Note 2: Empowering Sustainable Development with Deep Learning and Earth Observation HDR. Dr. Nesrine Chehata - Bordeaux INP
9:40 to 10:30	Panel 1: AI Factories program and Space applications • Dr Michel BOSCO, MAMIC, Belgium, Chair • Prof Ferdaous CHAABANE Sup Com, Tunisia • Prof Imed Riadh FARAH, NESM Director, Tunisia • Col. Haythem ISMAIL CNCT, Tunisia • Prof Nesrine CHEHATA, AGEOS, Tunisia
10:30 – 11:00	Coffee Break
SPACE POLICY & CHALLENGES	
11 :00 to 11:30	Key Note 3 : Space and Cooperation: A perfect match towards Sustainability Dr, Francesco LONGO, Head of the Earth Observation Office, Italian Space Agency
11:30 - 12: 30	Panel 2: A new frontier: Space policies, standards, markets and cooperation, organized by The AdWisers • Tomas MATRAIA – CEO of The AdWisers Strategic Advisory Group, Chair • Dr.Mondher KHANFIR, Tunisia African Business Council - Tunisie • Dr. Aicha ALOU, SATNAV Africa, Senegal • Catherine VIGNERON, Cen-Cenelec, Belgium • Stefano LA TERRA BELLA, European Union Commission • Dr Mehdi BENNA, PLANETARY SCIENTIST, NASA, USA
CNEEA, Celebrating 40 Years	
12:30 to 12:45	Key note 4: CNEEA and Space Activities in Tunisia, What'next Malek KOCHLEF, DG DCI MESRS
12:45 to 13:00	Closing Ceremony: Minister of Higher Education and Scientific Research CNEEA 40 anniversary ceremony
13:30	Closing Lunch

cientific Committee Chairs

- Prof Kamel BESBES, CRMN Sousse Technopole
- Prof Zohra LILI CHABAANE, INAT-IRESA
- Prof Refaat CHAABOUNI, ENIT

rogram and Organization Committee

- Dr. Samer LAHOUAR, CRMN Sousse Technopole
- Dr. Zeineb KSSOUK, INAT
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- Ing. Wafa TALHAOUI, CNCT-Tunis
- Prof. Nesrine CHEHATA, AGEOS
- IEEE Student GRSS-INAT

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- Jawaher BOUKTHIR
- Aziz MANSOUR

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International events in 2024

- **COPUOS, Scientific and Technical Subcommittee, 61nd session**
  - Vienna, February 2024
- **ITALY-AFRICA SPACE CONFERENCE,**
  - Roma, July 2024
- **IAC, 75th International Astronautics conference,**
  - Milan October 2024
- **WSF, World Space Forum UNOOSA**
  - Bonn December 2024
- **Horizon Europe Committee program**
  - Brussels, 4 meetings and 6 Adhoc meetings
- **4th International Conference & Exhibition. Advanced Geospatial Science & Technology**
  - 22-24 October 2024. Tunis, Tunisia..
  - **Invited Conference: New Trends in GNSS Technologies and Applications**

Contribution to Tunisian SPACE policy

Contribution to the drafting of new Tunisian SPACE Law

- CNEEA March 2024
- **Steering committee member**

Study day on perspectives on space development,

- Tunisia Aviation School, Borj EL Amri, March 7, 2024
- **Invited conference**: Nanosatellites: goals and challenges in space exploration and telecommunications

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Happy new year 2025 for our International network

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