Abdelrahman ASTRO

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Key Skills

- **Programming**: C/C++, Matlab, Octave, VHDL, Unix/Linux shell scripting, LaTeX
- **Software Process**: Git, SVN, Travis CI, Jenkins, Docker, Doxygen
- **OS**: Unix/Linux, OS X , Windows

Experience

- **TeCIP: Scuola Superiore Sant'Anna** — Pisa, Italy
  Graduate Engineer — *Aug. 2019 - Sep. 2020*
  - : Developed, tested, and evaluated mmWave FMCW 77-81GHz radar for automotive systems applications.
  - : Designed continuous integration framework to provide smooth developer-friendly workflows for TI AWR1843 sensor
  - : Configured the FMCW waveform (sensing profile, chirp & frame) to meet the Short Range Radar (*SRR*) profile use cases in the 79 GHz band with a maximum of 4 GHz bandwidth .
  - : Enabled signal processing algorithms i.e FFT for objects mapping and localization (Range, Velocity, and AoA).
  - : Increased the angular resolution from 14.3° to 4.7° by synthesizing an array of 12 virtual antennas using 3 Tx and 4 Rx in MIMO mode.
  - : Coded the firmware of the AWR1843 sensor i.e device drivers, data path processing APIs, sensing profiles.
  - : Achieved the design specs with a max range 30m & 4.3cm resolution, max velocity 36kmph & 0.32mps resolution.

    Key tools C Matlab YAML Bash TI-RTOS Travis Doxygen Code Composer mmWaveSDK LaTeX

- **SmartCI Research Center** — Egypt, Alexandria
  R&D Engineer — *Aug. 2017 - Oct. 2018*
  - : Contributed to Alexandria University campus construction with build-out of cellular network on-top of software-defined radios using USRPx300, USRPB210 & RTL-SDR.
  - : Upgraded the Cognitive Radio Cloud to be LTE enabled & compliant (1.4 to 20 MHz Bandwidth).
  - : Co-authored the training material and introduced students and researchers in the use of the platform/Cloud.
  - : Released custom disk images for GNURadio and OpenAirInterface5G.
  - : Implemented 3 classes of software radio applications using GNURadio (Analog, Digital, & Wireless Communication)
  - : Built a configurable 8x8 MIMO Based LTE eNodeB base station using the open-source framework OAI5G.
  - : Designed LTE Rel-10 RAN based experiments without core (S1 Interface) integration.

    Key tools GNURadio OAI5G SDR Matlab VNC Virtualbox

- **AUC: American University in Cairo** — Egypt, Cairo
  Research Assistant — *Feb. 2018 - Oct. 2018*
  - : Designed (Rate Aware- Instantly Decodable Network Coding) RA-IDNC using graph theory and greedy algorithm for a use-case of a single Base-Station, 20 users, and 20 files.
  - : Achieved higher throughput by decreasing the overall decoding completion time from 80 to 20 time-slots.

    Key tools Matlab LaTeX

Education

- **CIC — Canadian International College** — Egypt, Cairo
  Bachelor of Electrical Engineering; Major: Telecommunication Engineering; — *Sep. 2012 - May. 2017*
  Distinction with Honor; CGPA:(3.72/4.00)
  Thesis *Cognitive Radio Network*

Technical Skills & proficiency

- : Best understanding of 3GPP-standards: GSM, UMTS, LTE, LTE-A, and 5G-NR.
- : Vertical Knowledge of beyond 5G and future wireless technology.
- : Prior work on open-source Radio Access Networks development and integration.
- : Real-Time systems and concurrent programming (Multi-threading and Multi-processing) in C.
- : Experience in Unix/Linux development environment.
- : Knowledge of Configuration Management concepts and tools using git & SVN.
- : The development and deployment of Continuous Integration tools using Travis CI, & Jenkins.
- : Working knowledge of Docker / VMWare/ VirtualBox.
- : RTOS experience using TI-RTOS and Free-RTOS.
- : Knowledge and experience of Multi-core SOC architecture.
- : Experience in low-level software development in C.
- : RF programming (SDR, USRP, GNURadio, OAI5G).
- : RTL Programming in VHDL.
- : All list of recent implemented projects, source code, and documentation can be found the following link: https://bridgeit.tech/projects/List_of_Projects.pdf

Publication

[1] **A. Astro**, Omar Khaled, Amr Alaa, Mohamed Ali, Injy Mohy, and Ahmed H. ElDieb. "Real-Time Spectrum Occupancy Prediction". In: *2nd International Conference on Wireless Intelligent and Distributed Environment for Communication*. Ed. by Isaac Woungang and Sanjay Kumar Dhurandher. Cham: Springer International Publishing, 2019, pp. 219–232. ISBN: 978-3-030-11437-4. URL: https://link.springer.com/chapter/10.1007/978-3-030-11437-4_17.

Awards

- **2018-19**: Invest Your Talent In Italy Scholar
- **2012-17**: Academic Excellence Scholar, CIC
- **2017**: Best Academic Paper Award, 3rd CIC's Multidisciplinary International Conference
- **2015**: Special and Excellent effort in Scientific Projects in Communication Department, CIC

Languages

- **English**: Fluent
- **Arabic**: Native
- **French**: Basic