



**THE ELISHA YEGAL BAR-NESS  
CENTER FOR WIRELESS COMMUNICATIONS  
AND SIGNAL PROCESSING RESEARCH**

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**Affiliated faculty:** Abdi, Akansu, Bar-Ness (retired), Ge, Haimovich, Kliewer, Simeone

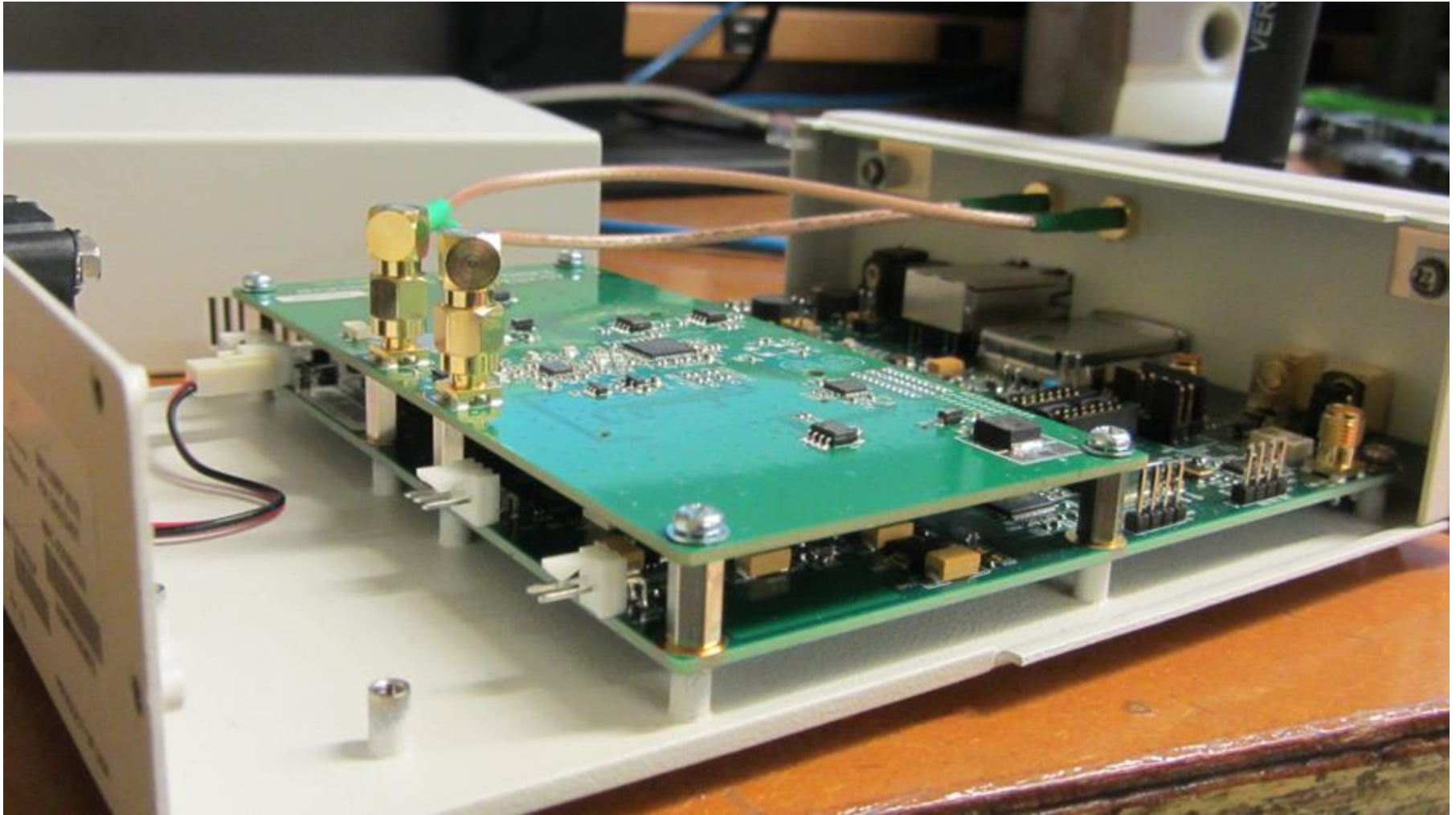
**Staff:** Angela Retino

**PhD students and visiting postdocs:**

Chen	Chen	Abdi
Iman	Habibi	Abdi
Ali	Alenezi	Abdi
Erjian	Zhang	Abdi
Yuewen	Wang	Akansu
Manan	Patel	Bar-Ness
Eyal	Katz	Bar-Ness
Nan	Wu	Bar-Ness
Erjian (Eric)	Zhang	Bar-Ness
Enlong	Hu	Ge
Nil	Garcia	Haimovich

Haley	Kim	Haimovich
Marco	Rossi	Haimovich
Pelin	Salem	Haimovich
Liu	Yu	Haimovich
Farshid	Mokhtarinezhad	Kliewer
Behzad	Ahmadi	Simeone
Mohamad	Elkourdi	Simeone
Ali Mohammad	Fouladgar	Simeone
Eunhye (Grace)	Heo	Simeone
Seongah	Jeong	Simeone
Jinkyu	Kang	Simeone
Shahrouz	Khalili	Simeone
Seok Hwan	Park	Simeone

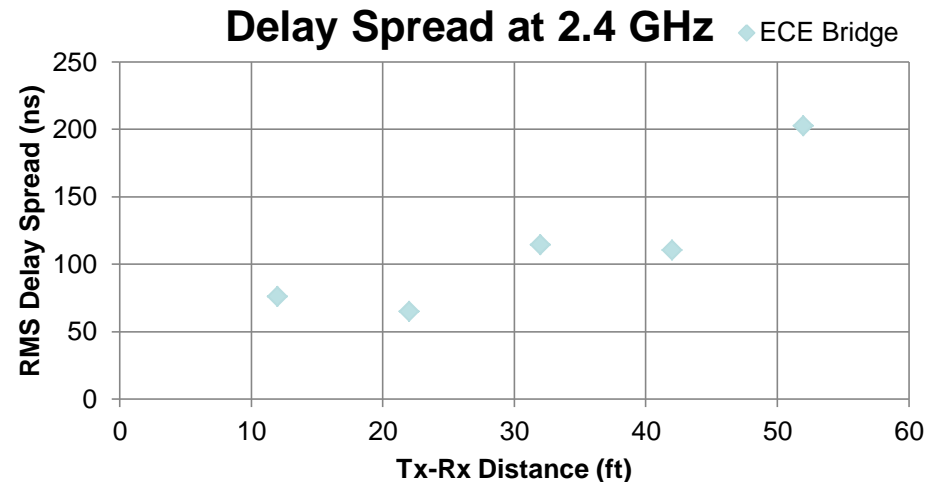
# Software Defined Radio



# Software-Defined Radio Projects

## Faculty: Ali Abdi

- Channel measurements using software defined radios, S. Yang (MS student).

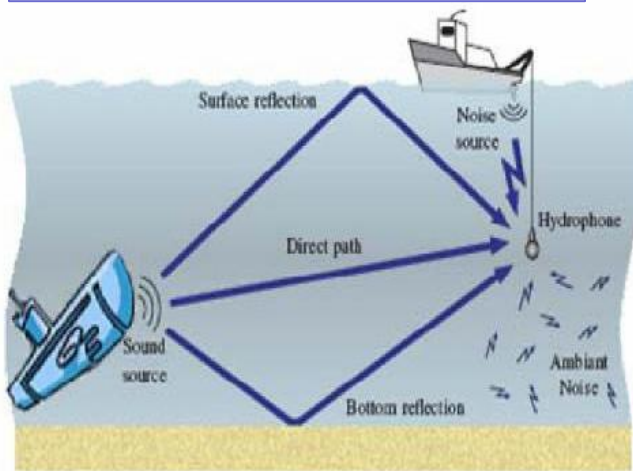


- Wireless channel estimation using the software-defined radio technology, Diego Agudelo, Khoa Dao, Kleber Solano (Undergraduate students).

# Abdi Projects

## Data Communication via the Vector Acoustic Field

Graduate Student: E. Zhang  
Sponsor: NSF

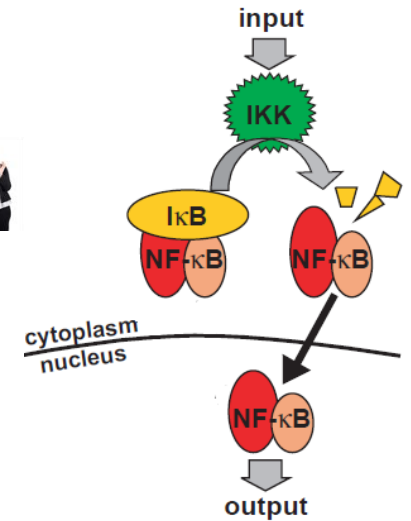
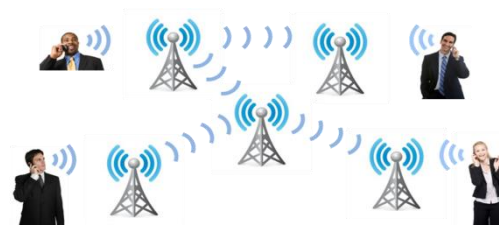
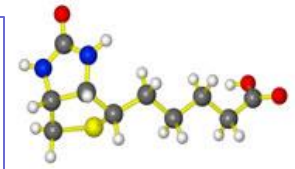


## Borehole Telemetry in Oil and Gas Fields

Graduate Student: A. Alenezi

## Systems Biology and Molecular Signaling

Graduate Student: I. Habibi



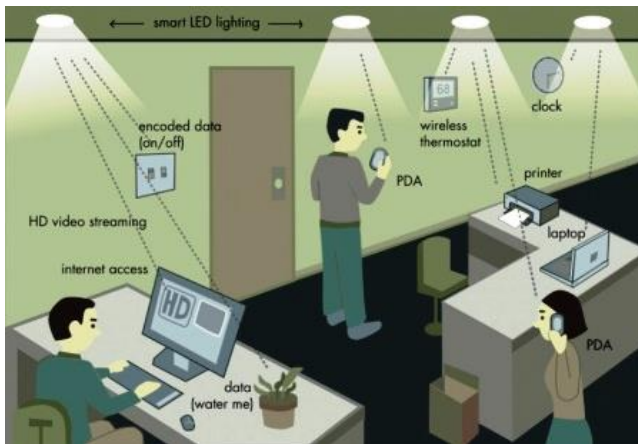
(A. Hoffmann, et al. Science 2002)



# Bar-Ness Projects

**Optical Wireless communications:  
Two - Dimensional Pixelated  
Optical Wireless Communications**

Grad student: Eyal Katz



**Optical Wireless communications: Indoor  
LED based Wireless Optical Communications**

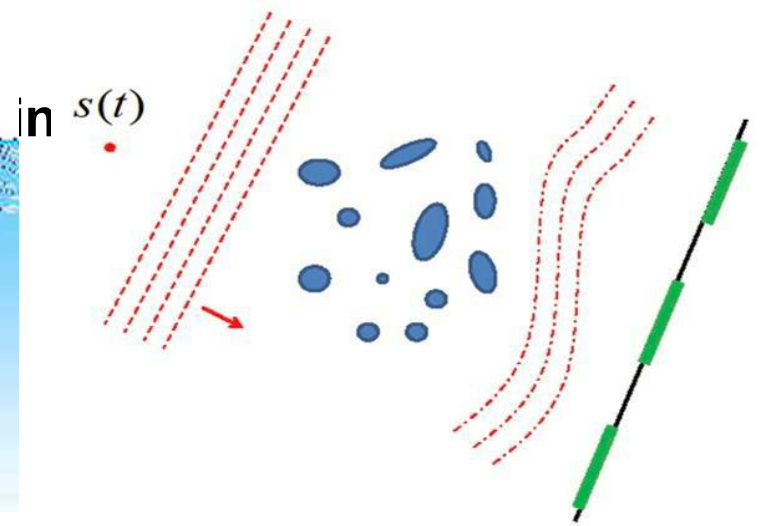
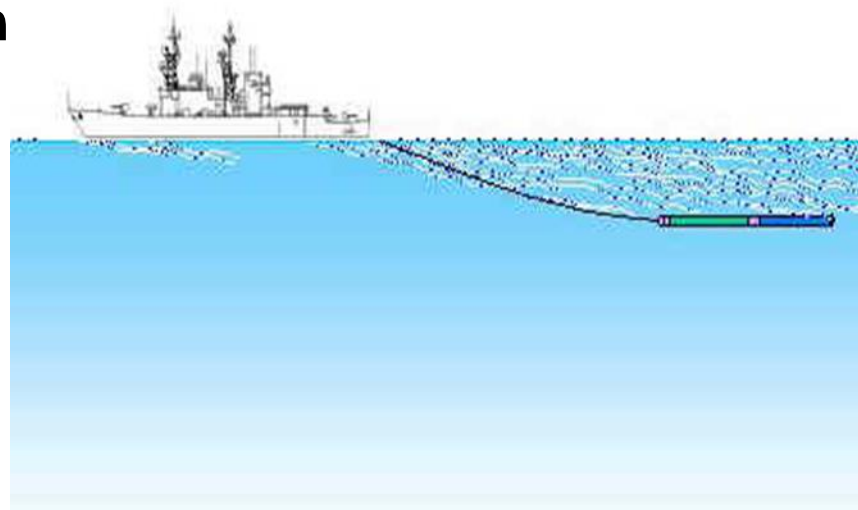
Grad student: Eyal Katz

**Optical Wireless communications:  
Power Efficient IM/DD Optical Wireless System**

Grad student: Nan Wu

**Statistical Analysis of Tempo-Spatial Cross-Correlation for discovering *signal components of special interest*, using datasets collected from multiple distributed array systems with applications in:**

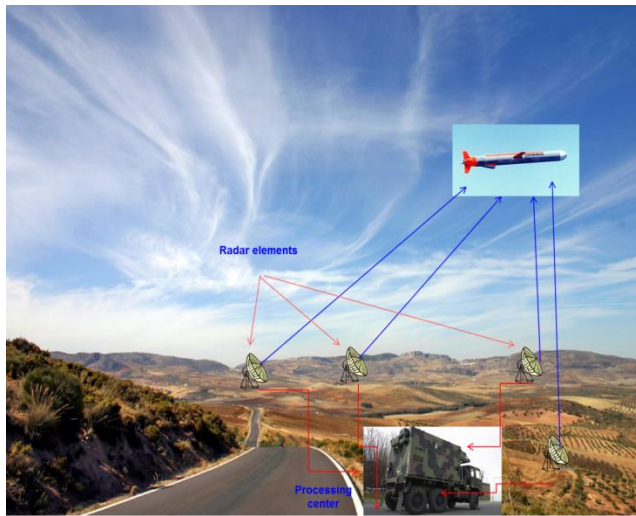
- Radio astronomy for RFI identification and excitation
- Underwater acoustic systems for detection, localization & tracking
- Wireless communication systems for effective transceiver design



# Haimovich Projects

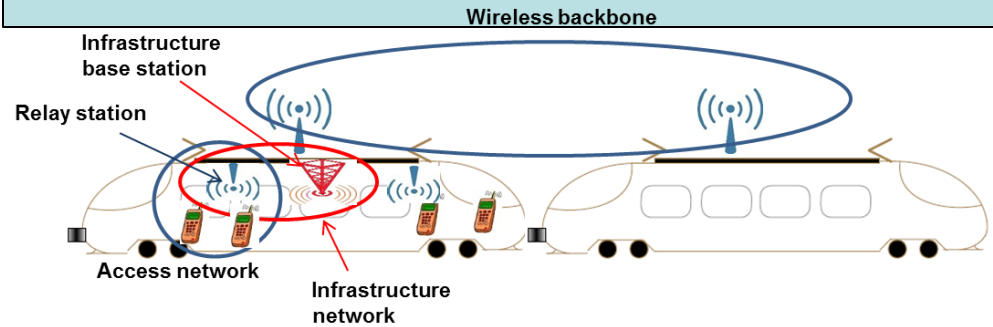
## Multiple-input multiple-output (MIMO) radar, compressed sensing

Grad students: Marco Rossi, Haley Kim  
Funding: AFOSR



## Wireless communication for High Speed Rail: Train Topology Discovery

Faculty: Mengchu Zhou, Osvaldo Simeone, A. Haimovich  
Grad students: Shahrouz Khalili, Yu Liu, N. Pelin Yalcin



Wireless backbone

Infrastructure base station

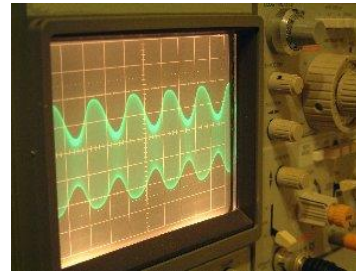
Relay station

Access network

Infrastructure network

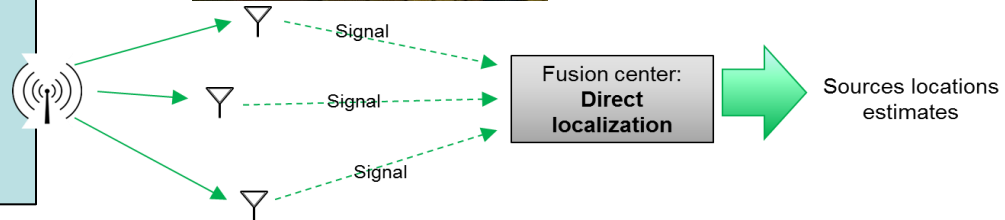
## Modulation classification of MIMO communication signals

Grad student: Yu Liu  
Faculty: A. Haimovich, O. Simeone  
Funding: US Army



## Localization of RF Emitters in Multipath

Grad student: Nil Garcia  
Funding: US Navy, SPAWAR

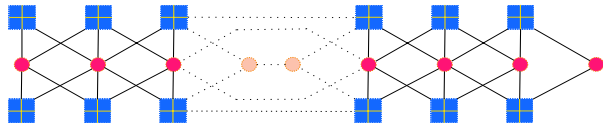




# Kliewer Projects

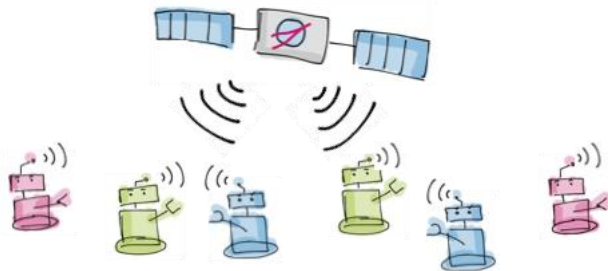
## Source compression with spatially coupled codes

Grad student: Ahmad Golmohammadi (NMSU)  
Funding: NSF



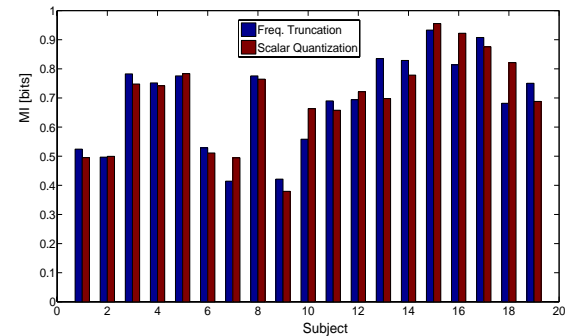
## Coordination and collaboration in wireless networks

Grad student: N.N.  
Collaborator: Matthieu Bloch (GA Tech)  
Funding: NSF



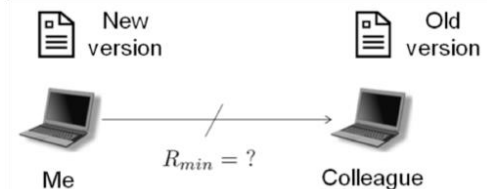
## Measuring and modeling information flow on the brain response channel

Grad student: Ketan Mehta (NMSU)  
Funding: NSF

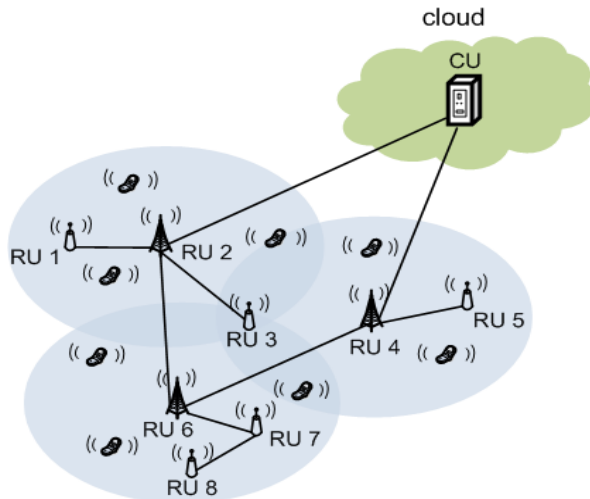


## Compression with side information under insertions and deletions

Grad student: Farshid Mokhtarinezhad  
Faculty: J. Kliewer, O. Simeone  
Funding: NJIT / NSF



# Simeone Projects

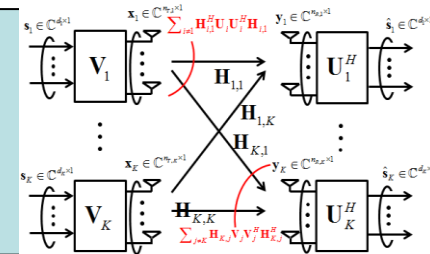


## Wireless communication for High Speed Rail: Train Topology Discovery

Faculty: Mengchu Zhou, Osvaldo Simeone, A. Haimovich  
Grad students: Shahrouz Khalili, Yu Liu, N. Pelin Yalcin

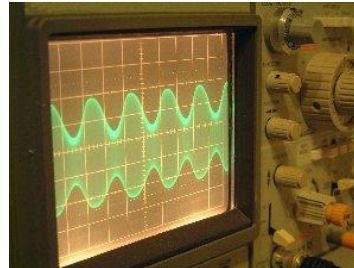
## Robust Interference alignment

Post-Doc: Tariq Elkourdi  
Grad students: Ali Fouladgar  
Funding: InterDigital



## Cloud Radio Access Networks

Post-Doc: Seok-Hwan Park  
Grad students: Jinkyu Kang (KAIST)  
Collaborators: Shlomo Shamai (Technion), Onur Sahin (InterDigital), Joonhyuk Kang (KAIST)  
Funding: InterDigital, Vienna Science and Technology Fund



## Modulation classification of MIMO communication signals

Grad student: Yu Liu  
Faculty: A. Haimovich, O. Simeone  
Funding: US Army

## Joint Wireless Energy and Information Transfer

Grad students: Ali Fouladgar  
Collaborators: Elza Erkip (NYU Poly)