ICT, Education & Research in the United Arab Emirates

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The Emirates

Central Hub of ME, Gulf, SEAsia

Abu Dhabi & Dubai

Oil, Tourism, Trade, Services

Neutrality, Openness, Prosperity

Fast-Developing & Multicultural

Key Overall Figures

Size: 84000 sq.km

Population: 5M (20% Citizens), Growth Rate: 3.8% (No.1 in the world)

GDP: 190/230 billion (4% drop, Oil & Gas portion 25%), Per Capita 40K (24th)

Exports: 175b (Crude Oil: 45%), JP 20%, KOR 10%, IND 10%, IRN, THA

Imports: 145b (Machinery, Chem, Food): CN 15%,IND 15%,US 9%,DE 6%,JP 5
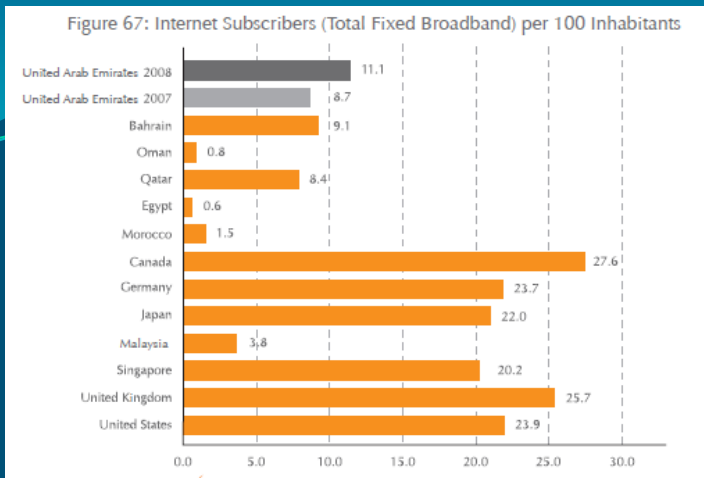
Currency: AED pegged to USD at 3.67

Education: Of 43.6bi 2010 Federal (Not State) Budget, 16.5% to Edu, 6% to Uni-R&D-Scholarshipe

Telephones: 2M + 10M cell, cells/pop No.1 in world

Internet: 400K hosts, >3M connections (2008)

(sources: CIA world factbook, UAE ICT Report)

Figure 67: Internet Subscribers (Total Fixed Broadband) per 100 Inhabitants
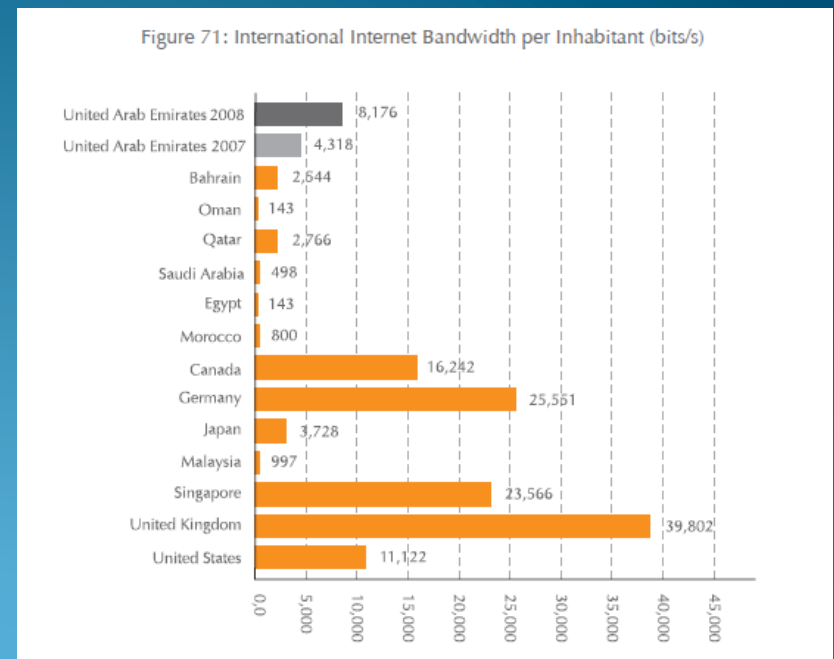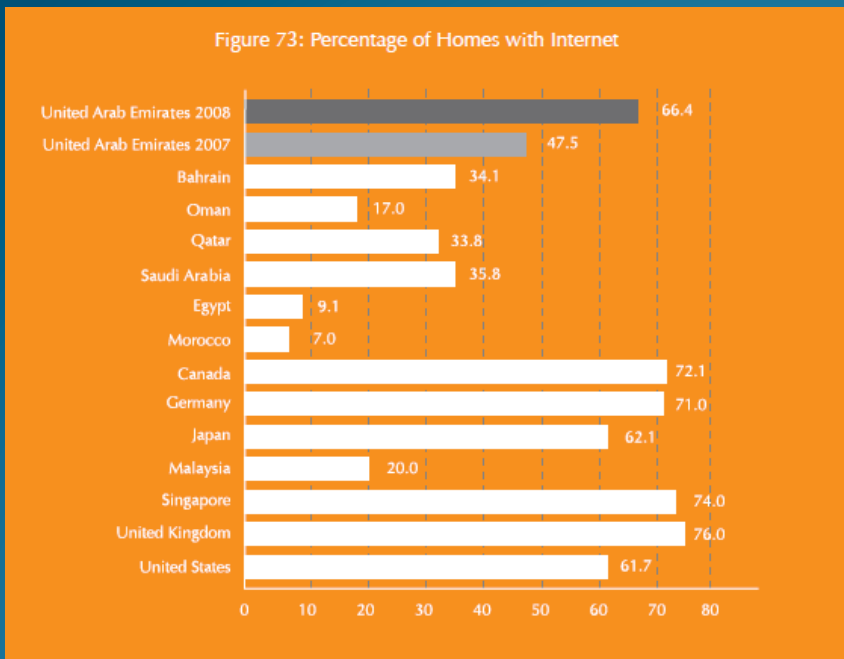
ICT in the UAE

(source: UAE TRA ICT study)

- The UAE is the top performing country in ICT among the Arab states.
- Still some progress needed to be equivalent to leading ICT countries such as Western Europe.

Figure 73: Percentage of Homes with Internet

Figure 71: International Internet Bandwidth per Inhabitant (bits/s)

e-Government in the UAE

In the United Nations e-Government Survey 2008, the UAE is:

• The top ranking Arab state in terms of e-readiness.

• The top Arab state in the web-measure index which assesses the extent to which governments are providing e-government

policies, applications and tools, and the 12th in the world.

• The fifth highest ranking country in the world in terms of transactional services.

(source: UAE TRA ICT study)

Higher Edu in the UAE

(source: UAE 2009 handbook, NMC)

Ministry of Higher Education and Scientific Research (Federal)

Abu Dhabi Education Council / Dubai Education Council

95% of all females and 80% of all males from high school apply for Uni

2008/09: 13.3K Emirati incoming students

UAEU: 3400, HCT: 7900, ZU: 1500, 500 overseas scholarships (150 pgrad)

HCT in many cities. CERT is HCT's commercial Arm

UAEU

Largest, Oldest, Only Full-Coverage Uni

40K alumni up to date

16K students , 2800 Graduates (2200 Girls) / Yr

Other Higher Edu

And many smaller and starting:
NYIT, EPFL RAK, Wollongong,
Herriot-Watt, Canadian Uni,
...and 20 or so more!

Research in the UAE

Some basic prerequisites for Research:

a) **Graduate Programs, MS and mainly PhD's**

Quite a number of MSc's

Very Few and 1-year-old PhD's + very small (50 -200total) + Emir/ International

b) **Research Funding (Uni, National, International, Industrial)**

NRF, EF (40KEu/2yr), ICT Fund, Internal Funds, (UAEU: 2KEu), QNRF

c) **Flexible Buerocracies**

d) **Support for Spin-offs and Entrepreneurship**

Arab Youth Venture Foundation, Microsoft / Young Achievers Injaz

Research in the UAE

Latest News:

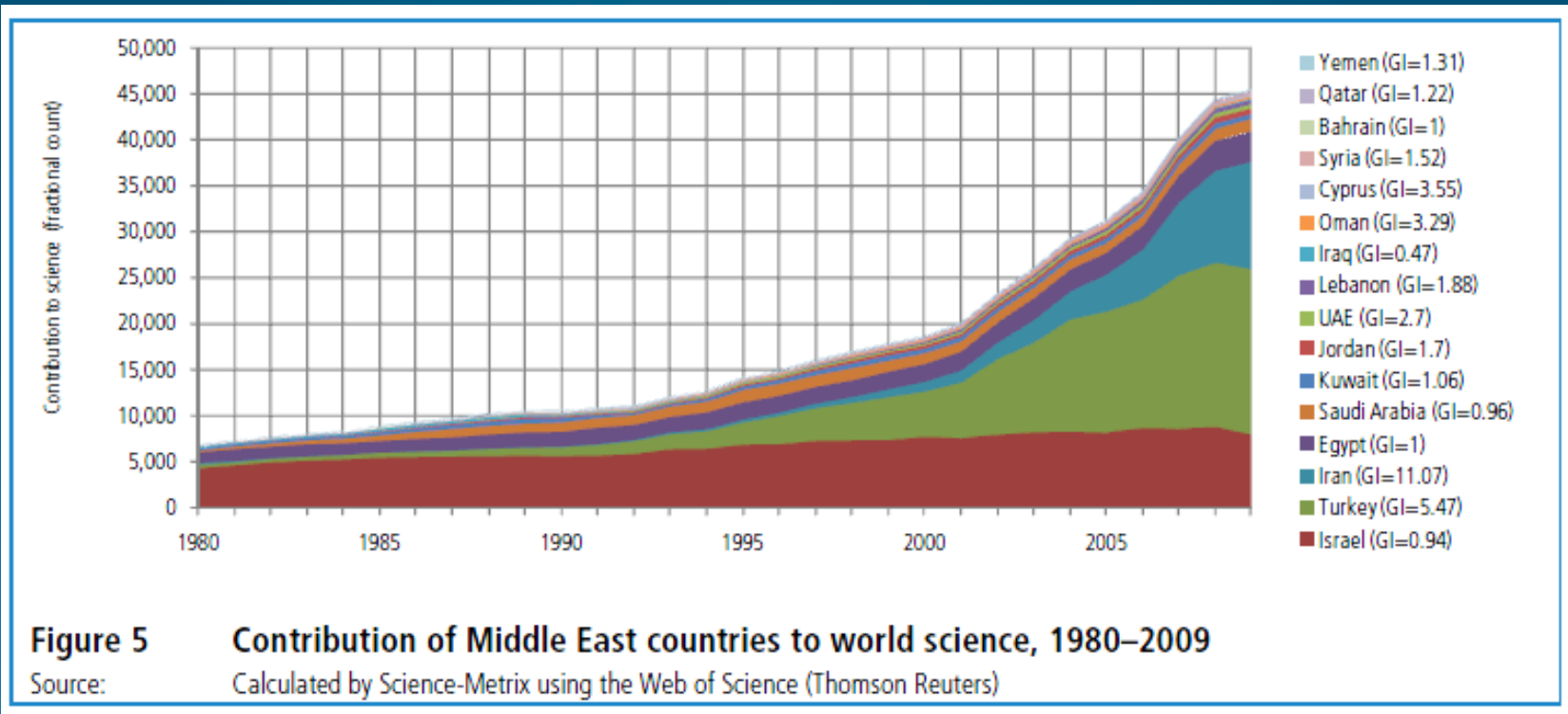**ADEC, ATIC, Globalfoundries (3rd semicon foundry) & Ecosystem**

Some Key Innovation Measures: (source: National Landscapes of Information Tech, ITEC 654)

Variable	United Arab Emirates		Israel	
	actual	normalized	actual	normalized
University-Company Research Collaboration (1-7), 2006	3.30	5.69	5.20	9.22
Scientific and Technical Journal Articles, 2003	193.00	4.73	6941.00	8.55
Scientific and Technical Journal Articles / Mil. People, 2003	48.25	5.95	1035.97	9.77
Availability of Venture Capital (1-7), 2006	4.70	8.36	5.50	9.83
Patents Granted by USPTO, avg 2001-05	4.60	5.61	1093.40	9.02
Patents Granted by USPTO / Mil. People, avg 2001-05	1.17	6.82	163.81	9.47
High-Tech Exports as % of Manuf. Exports, 2004	10.20	6.48	18.80	8.03
Private Sector Spending on R&D (1-7), 2006	3.40	6.03	5.30	9.40
Firm-Level Technology Absorption (1-7), 2006	5.60	8.19	6.10	9.48

But, 4 years can make a difference!

The Middle East Landscape

Figure 5   Contribution of Middle East countries to world science, 1980–2009

Source: Calculated by Science-Metrix using the Web of Science (Thomson Reuters)
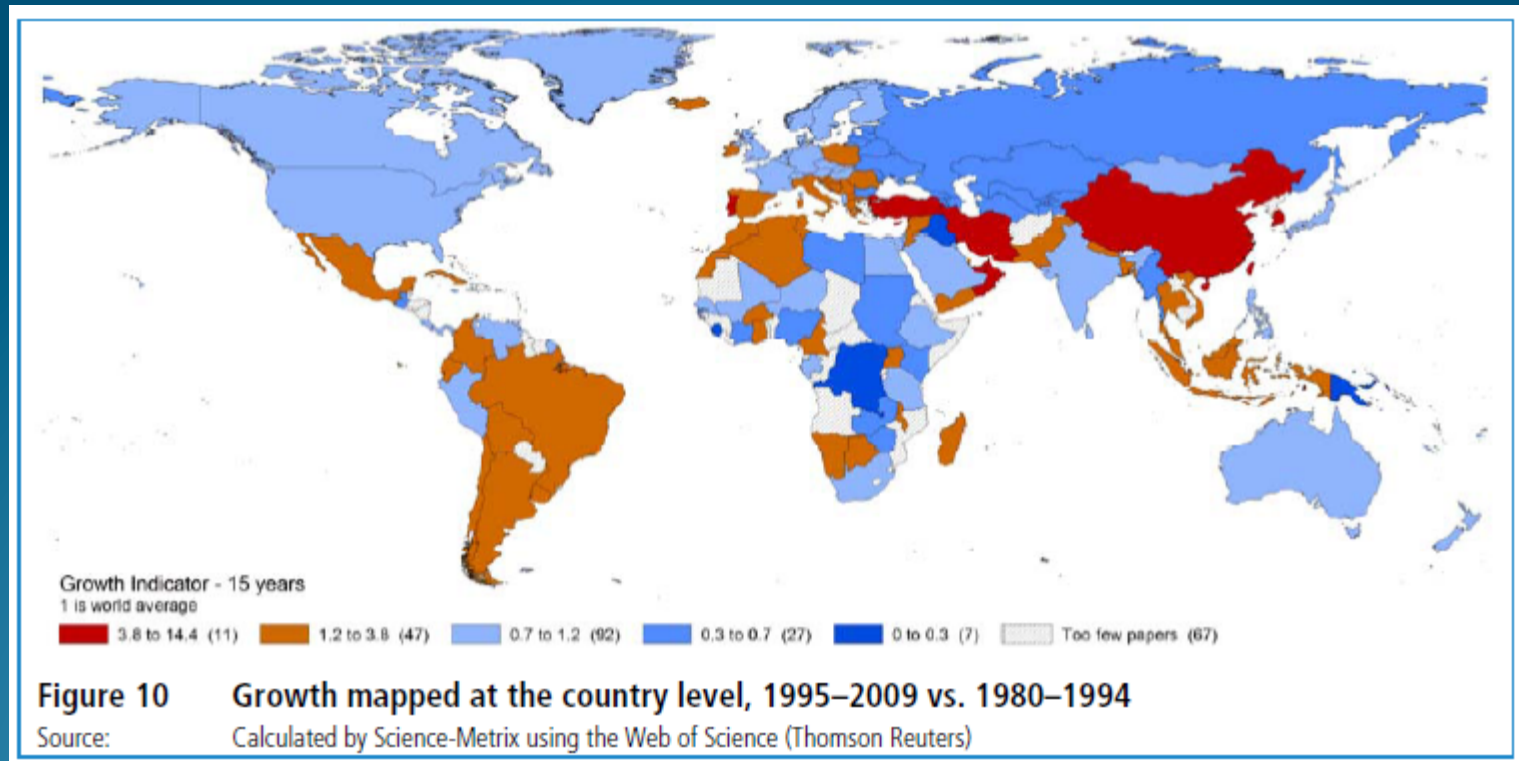
Absolute Figures, Computer Science pubs in 2008

	Country	Documents	Citable documents	Citations	Self-Citations	Citations per Document	H index
1	United States	16.645	15.859	20.229	8.864	1,22	349
2	China	14.885	14.734	8.637	6.014	0,58	99
3	United Kingdom	5.910	5.628	6.373	2.202	1,08	156
4	Germany	5.742	5.541	5.501	2.337	0,96	138
5	France	4.983	4.816	4.423	1.777	0,89	132
6	Japan	4.449	4.336	2.819	1.135	0,63	111
7	Canada	4.394	4.203	4.368	1.425	0,99	127
8	Italy	3.977	3.802	3.542	1.424	0,89	114
9	Spain	3.464	3.341	2.947	1.395	0,85	93
10	Taiwan	3.270	3.198	3.273	1.305	1,00	88
11	South Korea	2.973	2.908	2.088	823	0,70	80
12	Australia	2.221	2.137	2.005	657	0,90	95
13	Netherlands	1.954	1.855	2.093	690	1,07	104
14	India	1.760	1.719	1.166	348	0,66	80
15	Switzerland	1.411	1.344	1.764	459	1,25	109
16	Hong Kong	1.373	1.336	1.784	433	1,30	88
17	Poland	1.340	1.306	675	318	0,50	56
18	Brazil	1.316	1.259	903	381	0,69	56
19	Belgium	1.263	1.208	1.415	488	1,12	83
20	Greece	1.234	1.171	1.079	382	0,87	66
21	Singapore	1.198	1.145	1.475	459	1,23	75
22	Israel	1.188	1.143	1.311	354	1,10	103
23	Sweden	958	923	1.141	353	1,19	85
24	Austria	945	891	975	342	1,03	67
25	Finland	915	885	876	268	0,96	72
26	Turkey	856	826	1.006	419	1,18	54
27	Iran	825	807	730	364	0,88	31
28	Portugal	718	684	511	138	0,71	51
29	Russian Federation	638	623	264	106	0,41	43
30	Norway	620	595	625	160	1,01	48

	Country	Documents	Citable documents	Citations	Self-Citations	Citations per Document	H index
31	Denmark	573	536	693	171	1,21	69
32	Mexico	558	543	348	116	0,62	45
33	Czech Republic	554	533	408	150	0,74	39
34	Ireland	481	463	448	99	0,93	48
35	New Zealand	406	392	367	100	0,90	52
36	Romania	399	386	215	115	0,54	28
37	Hungary	347	336	289	88	0,83	49
38	Malaysia	329	323	165	44	0,50	27
39	Slovenia	292	286	236	77	0,81	32
40	Egypt	209	208	182	61	0,87	32
41	Argentina	205	202	185	40	0,90	29
42	Thailand	201	196	126	40	0,63	26
43	Chile	198	192	177	55	0,89	26
44	South Africa	198	185	95	28	0,48	34
45	Algeria	160	159	82	16	0,51	16
46	Tunisia	150	145	88	32	0,59	17
47	Ukraine	149	147	117	44	0,79	18
48	Serbia	142	140	154	74	1,08	10
49	Slovakia	135	134	91	22	0,67	27
50	Saudi Arabia	127	119	71	17	0,56	21
51	Jordan	126	125	54	13	0,43	18
52	Pakistan	125	124	69	21	0,55	17
53	Bulgaria	120	116	51	14	0,43	21
54	Croatia	110	109	71	36	0,65	20
55	United Arab Emirates	105	99	55	7	0,52	19
56	Cyprus	92	86	48	19	0,52	23

(source: SCIMago Journal & Country Rank)

Global Research Output Growth Rates

Growth Indicator - 15 years
1 is world average

3.8 to 14.4 (11)	1.2 to 3.8 (47)	0.7 to 1.2 (92)	0.3 to 0.7 (27)	0 to 0.3 (7)	Too few papers (67)

Figure 10 — Growth mapped at the country level, 1995–2009 vs. 1980–1994

Source: Calculated by Science-Metrix using the Web of Science (Thomson Reuters)

Robotics in the Emirates

Beginnings: Al Jazzari

Current Efforts / Teams:

UAEU: Interactive Robots and Media Lab

Kustar: Search & Rescue Robotics, Lakmal

MASDAR: Human-Robot Teamwork, Crandall

World Robotics Olympiad 2011

...And much more!

An hours drive from Dubai:
(An important center of ME/SE Asia)
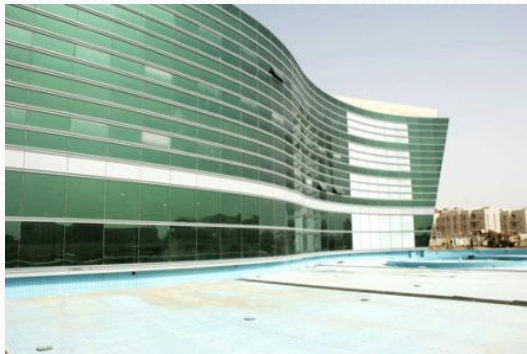
United Arab Emirates University (UAEU)
No.2 in Research in the Arab World

Challenges of Academia in the Middle East
...decided to create the first Interactive Robots Lab in the region!

Since 2008
Major Projects:

"FaceBots" Microsoft seed fund award HRI CFP

"IbnSina" Arabic-Spk Humanoid & Interactive Theater

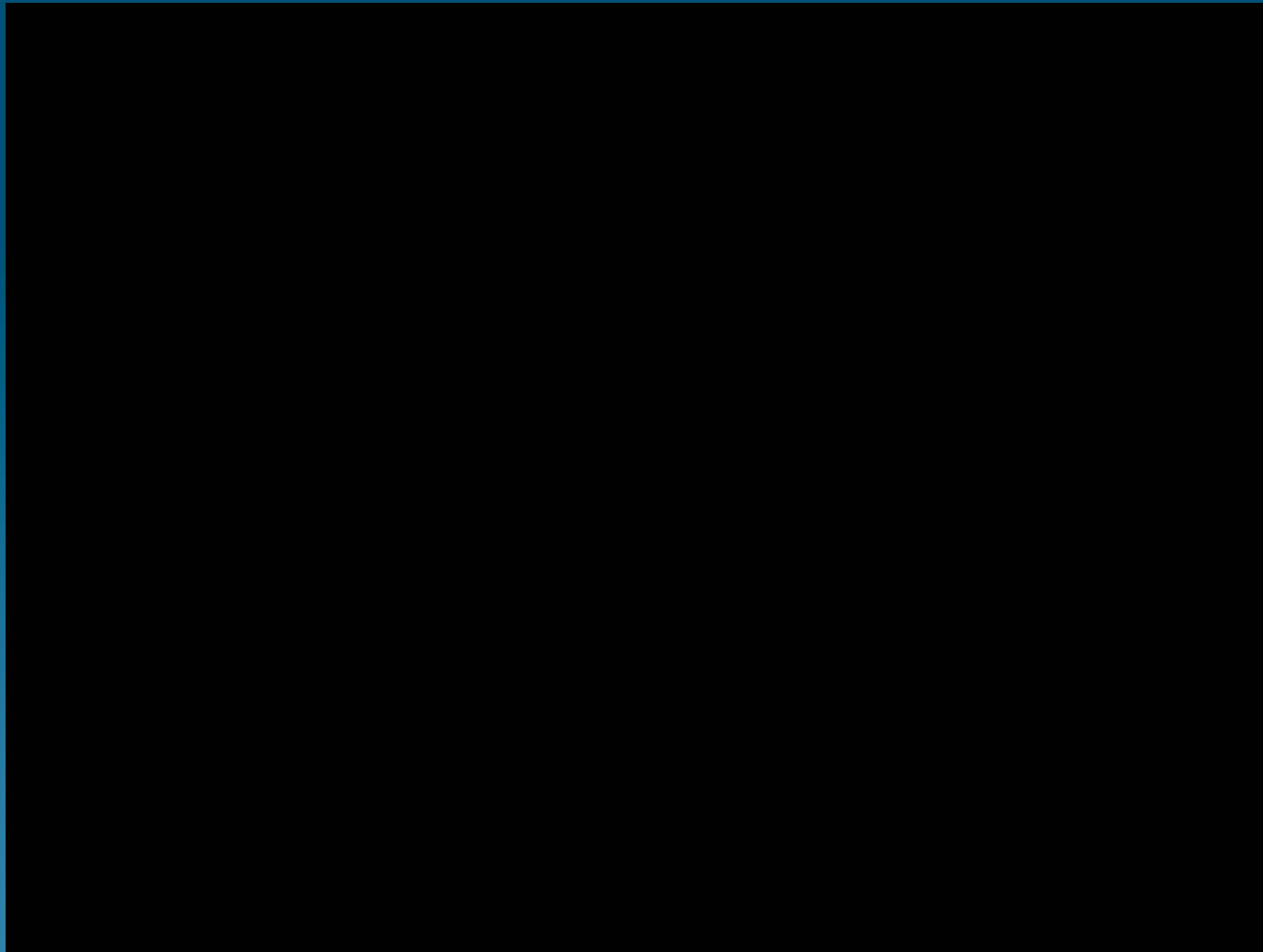Student Projects, Summer Schools (!), UAE Cognitive Science Society...

Ibn Sina & FaceBots

FaceBots:

SOCIAL ROBOTS UTILIZING FACEBOOK

Nikolaos Mavridis, Shervin Emami, Chandan Datta, et. al.

Interactive Robots and Media Lab
United Arab Emirates University

Ibn Sina on TV round the world

IRML's Robotic Teleop System

In Conclusion

We have talked about:

The Emirates

Key Overall Figures

ICT in the UAE, e-Government in the UAE

Higher Education in the UAE, State & Private

Research in the UAE

Robotics in the Emirates & IRML as a case study

In short:

A wonderful opportunity for growth,

and for fruitful synergies with the EU!