

Kim Baraka

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Assistant Professor (Tenure-track)

Social Artificial Intelligence Group, Department of Computer Science, Vrije Universiteit Amsterdam

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Pronouns: he/they

Note to digital viewers: All colored text contains hyperlinks.

EDUCATION

- Carnegie Mellon University (CMU), The Robotics Institute (RI)** PITTSBURGH, PA, USA
Ph.D. in Robotics *Aug '16 – Aug '20*
Thesis committee: Profs. Manuela Veloso (co-advisor), Francisco S. Melo (co-advisor), Henny Admoni, Aaron Steinfeld, Iolanda Leite (KTH Royal Institute of Technology), and Luca Iocchi (Sapienza University of Rome).
GPA: 4.0/4.0.
- Instituto Superior Técnico (IST), Universidade de Lisboa** LISBON, PORTUGAL
Ph.D. in Electrical and Computer Engineering (ECE) *May '17 – Aug '20*
Awarded “with Distinction” as part of the CMU/Portugal dual degree program.
- CMU, RI** PITTSBURGH, PA, USA
M.S. in Robotics *Aug '14 – May '16*
Thesis committee: Profs. Manuela Veloso (advisor), Illah Nourbakhsh, Stephanie Rosenthal, and Heather Knight.
GPA: 4.0/4.0.
- American University of Beirut (AUB)** BEIRUT, LEBANON
Bachelor in ECE *Oct '09 – Dec '13*
Graduated “with High Distinction”. Minors in Physics, Mathematics, and Philosophy.
Final Year Project supervisors: Profs. Rouwaida Kanj and Ayman Kayssi.
GPA: 4.0/4.0.

EMPLOYMENT

- Vrije Universiteit (VU) Amsterdam, Dept. of Computer Science (CS)** AMSTERDAM, THE NETHERLANDS
Tenure-track Assistant Professor (Universitair Docent 2) *Apr '21 – present*
Member of the Social Artificial Intelligence group.
- The University of Texas (UT) at Austin, ECE Department** AUSTIN, TX, USA
Postdoctoral Research Fellow *Sep '20 – Mar '21*
Conducted research on algorithms for robots learning from humans in the **Socially Intelligent Machines (SIM) Lab**, under Prof. Andrea Thomaz.
- CMU** PITTSBURGH, PA, USA
Graduate Research Assistant *Jan '15 – Aug '20*
Conducted research for my M.S. and Ph.D. in the **CORAL** group led by Prof. **Manuela Veloso**. In addition to research, I maintained robot software and hardware and was responsible for a large number of demos with different robots.
- INESC-ID** LISBON, PORTUGAL
Junior Researcher *May '17 – April '19*
Worked as part of the **Group on Artificial Intelligence for People and the Society (GAIPS)**, led by Prof. **Ana Paiva**. Conducted my Ph.D. research within the **INSIDE** project in partnership with the **Child Development Center** at the **Hospital Garcia de Orta, Almada, Portugal**.
- Visiting Researcher** *Jun – Jul '15*
Conducted Human-Robot Interaction research in the **GAIPS** group under Prof. **Ana Paiva**. Work included programming a social mobile robot for fluid interaction in a study with autistic children and integrating a 3D animation software with a manipulator robot.

AUB

BEIRUT, LEBANON

Research Assistant: Task scheduling in the future Smart Power Grid

Oct '13 – Jul '14

Designed a fast heuristic algorithm for the NP-hard Resource Leveling Problem in the context of task scheduling for houses connected to the future Smart Grid. Supervisors: Prof. [Rouwaida Kanj](#) and Prof. [Fadi Zaraket](#).

Research Assistant: Vehicular Ad Hoc Networks (VANET)

Feb – May '13

Designed a smart sensing architecture for cognitive VANETs. Supervisor: Prof. [Hassan Artail](#).

European Organization for Nuclear Research (CERN)

GENEVA, SWITZERLAND

Summer Intern

Jun – Jul '13

Worked under Dr. [Christian Lippmann](#) and Heinrich Schindler, as part of the Summer Students Program. Contributed to [Garfield++](#), a software for simulation of gaseous particle detectors, and studied its applications to the Time Projection Chamber of the [ALICE](#) experiment on the Large Hadron Collider.

Musical Lights

BEIRUT, LEBANON

Main Engineer

Oct '13 – Jul '14

Developed an innovative interactive music educational system within a startup environment. Strategized patenting effort (U.S. patent application No. 20150332601) and contributed to the technical details of the patent.

University of California San Diego, ECE Department

SAN DIEGO, CA, USA

Summer Intern

Jul – Aug '12

Worked in the Telecom Integrated Circuits and Systems group under Prof. [Gabriel Rebeiz](#). Built and tested all parts of a 7 MHz Ham Radio on a Printed Circuit board.

AWARDS, HONORS, and GRANTS

Innovation PhD project grant

Jun '21

Granted by the CS dept. at the VU for the project “Robot behavior learning with influenceable human teachers” (in collaboration with prof. [Gusztai Eiben](#), prof. [Koen Hindriks](#), and dr. [Eliseo Ferrante](#)).

RSS Pioneer

Jun '19

Selected to be part of this fully funded doctoral consortium at the “Robotics: Science and Systems (RSS)” conference (acceptance rate 30%)

Best Paper and Best Student Paper Award Nominations

May '19

AAMAS'19: “An Optimization Approach for Structured Agent-Based Provider/Receiver Tasks” (conference acceptance rate 24%)

CMU/Portugal Ph.D. Fellowship

Aug '16 – present

Awarded by the [Fundação para a Ciência e a Tecnologia](#) (Portugal) for a period of 4 years

IEEE Student Enterprise Award

Aug '13

Awarded for innovative Smart Home technology (included monetary prize)

Dean's Creative Achievement Award (AUB)

May '13

Awarded for creative innovation in Bachelor thesis work

Full Merit Scholarship (AUB)

Oct '09 – Dec '13

Tuition coverage for all semesters (4.5 years)

Dean's Honor List (AUB)

Oct '09 – Dec '13

Was placed on the list all semesters

“Most Uncanny” Award at the 2015 Robot Film Festival

Nov '15

Awarded for a [short movie](#) featuring a Baxter robot programmed to dance with humans

RobotArt Competition 9th place

Jan '16

Awarded for collaborative robot painter (included \$2,500 prize)

TEACHING

TAUGHT COURSES

VU Amsterdam, AI Master program

AMSTERDAM, THE NETHERLANDS

Socially Intelligent Robotics (expected)

Nov – Dec '21

Co-taught with prof. [Koen Hindriks](#).

Socially Intelligent Robotics Project (expected)

'22

Co-taught with prof. [Koen Hindriks](#).

TEACHING ASSISTANTSHIPS

- IST, Dept. of Computer Science & Engineering LISBON, PORTUGAL
Machine Learning and Intelligent Decision Making (Master level) Feb – Jun '18
Taught several lectures to students across two campuses, as well as weekly lab sessions. Assisted in assignment and exam grading and preparation.
- CMU, RI PITTSBURGH, PA, USA
Human-Robot Interaction (grad level) Jan – May '17
Assisted in assignment grading and preparation, as well as project evaluation and logistics. Gave a guest lecture on non-verbal robot communication.
- Human-Robot Interaction (undergrad level)** Mar '20
Taught a guest lecture.
- AUB, ECE Dept. BEIRUT, LEBANON
Digital Integrated Circuits (undergrad/grad level) Feb – May '13
Assisted in homework solutions/corrections and lab assignments.
- Electronic Circuits (undergrad level)** Oct '12 – May '13
Taught weekly problem solving sessions for two editions of the course.

TRAINING

- Eberly Center for Teaching Excellence and Educational Innovation, CMU PITTSBURGH, PA, USA
Future Faculty Program Jul '19 – Aug '20
This program, meant to prepare graduate students for a teaching career, included 8 seminars, 4 workshops, 2 teaching observations, 1 course design project, and 1 statement of teaching philosophy project. Transcript available upon request.

MENTORING

PH.D. LEVEL

- UT Austin, SIM Lab AUSTIN, TX, USA
Mai Lee Chang Sep '20 – ongoing
Taylor Kessler Faulkner Sep '20 – ongoing
Shih-Yun Lo Sep '20 – Mar '21
Akanksha Saran Sep '20 – ongoing

MASTER LEVEL

- VU Amsterdam AMSTERDAM, NETHERLANDS
André Jesus (second reader) Jul '21 – ongoing
Tentative thesis title: "Autonomous Racing System identification".
- CMU, RI PITTSBURGH, PA, USA
Samantha Speer (thesis committee member) Nov '19 – Apr '20
Thesis title: "Grounding Abstract Concepts With Robotic Manipulatives".

BACHELOR LEVEL

- VU Amsterdam AMSTERDAM, NETHERLANDS
Milan de Jonge (main supervisor, in collaboration with Fectar) April – July '21
Thesis title: "Optimizing how Users Explore an AR Space".
- Daniëlle Dijkstra (second reader)** July '21
Thesis title: "Design and Evaluation of a Guessing Game on the NAO Robot".
- Lotte Hurkens (second reader)** July '21
Thesis title: "Eating Disorders Awareness through Serious Gaming".
- Dewi Spooren (second reader)** June '21
Thesis title: "Improving the Recommendation of Meals in the PROMISS Application by Using Machine Learning Algorithms".
- Undergraduate Research Opportunities (CMU) PITTSBURGH, PA, USA
Jocelyn Huang and Patrick Lin Jan – May '17
Project: Designing autism-like behaviors for a humanoid robot.
- Minji Kim and Harleigh Awner** Jan – May '17
Project: Building a 3D animated avatar exhibiting autism-like behaviors.

SERVICE

PROFESSIONAL

Workshop co-organizer

RSS'21 Workshop on Robotics for People: Perspectives on Interaction, Safety, and Learning

Program Committee Chair

RSS Pioneers '20

Lead Guest Editor

Special Issue on Robots and Autism: Conceptualization, Technology, and Methodology (Paladyn, Journal of Behavioral Robotics) May '21

Assistant Editor

Paladyn, Journal of Behavioral Robotics

Feb '19 – present

Study group member

IEEE Study Group on Metrology for Human-Robot Interaction

Sep '21 – present

Program Committee Member

International Conference on Social Robotics '17

International Workshop on Explainable, Transparent Agent and Multi-Agent Systems '21

International Workshop on Evaluation Methods Standardization for Human-Robot Interaction '17

Reviewer

(Journals) Frontiers in Robotics and AI; THRI; SORO; Adaptive Behavior; Paladyn; IEEE Systems; Industrial Informatics; RA-L...

(Conferences) HRI; IROS; Humanoids; ICDL-EpiRob; ICSR; RO-MAN; HAI; ACII; Robophilosophy; Ubiquitous Robots...

(Workshops/Symposia) RSS Pioneers; AAAI Symp. on AI for HRI; AHRI@RSS'17; HRI Pioneers...

(Book proposal) Springer Int. Series on Computer Entertainment & Media Technology

DEPARTMENTAL

CMU, RI

Interview Committee Member for Director Search

Interviewed and rated candidates for the CMU Robotics Institute director position as a student representative. Oct '19 – present

Ethics Advocate

Co-organized a student-led effort to introduce specialized ethics education in our robotics curriculum. Was invited to the faculty retreat to present our vision and survey findings. Jun '19 – Aug '20

Reading Group Organizer

Started a campus-wide HRI reading group (now robotics reading group) at IST, where papers are discussed on a weekly basis, and discussion minutes are posted [online](#). Feb '18 – May '19

AFFILIATIONS

Institute of Electrical and Electronics Engineers (IEEE) Member

Dec '09 – present

PUBLICATIONS

(full texts available through [hyperlinks](#))

JOURNALS

[J1] **Baraka K.**, Couto M., Melo F.S., Paiva A., Veloso M.: “Investigating Action Sequences for a Humanoid Robot Interacting with Children with Autism in Attention Tasks”. **(in preparation)**

[J2] **Baraka K.**, Melo F.S., Couto M., Veloso M.: “Optimal Action Sequence Generation for Assistive Agents in Fixed Horizon Tasks”, Journal of Autonomous Agents and Multi-Agent Systems, Springer, 2020. **(by invitation)**

[J3] **Baraka K.**, Melo F.S., Veloso M.: “Interactive Robots with Model-Based ‘Autism-Like’ Behaviors”, Paladyn, Journal of Behavioral Robotics, Special Issue on Social Robots in Therapy 10(1), 103-116, De Gruyter, 2019.

[J4] **Baraka K.**, Veloso M.: “Mobile Service Robot State Revealing through Expressive Lights: Formalism, Design and Evaluation”, International Journal of Social Robotics 10(1), 65-92, Springer, 2018.

[J5] **Baraka K.**, Safatly L., Artail H., Ghandour A., El-Hajj A.: “An Infrastructure-aided Cooperative Spectrum Sensing Scheme for Vehicular Ad Hoc Networks”, Ad Hoc Networks 25, 197-212, Elsevier, 2015.

CONFERENCES

- [C1] **Baraka K.**, Couto M., Melo F. S., Veloso M.: *“An Optimization Approach for Structured Agent-Based Provider/Receiver Tasks”*, In Proceedings of AAMAS’19, the International Conference on Autonomous Agents and Multiagent Systems, Montreal, Canada, May, 2019. (**Best Paper and Best Student Paper awards nominee**)
- [C2] **Baraka K.**, Melo F. S., Veloso M.: *“ ‘Autistic Robots’ for Embodied Emulation of Behaviors Typically Seen in Children with Different Autism Severities”*, In Proceedings of ICSR’17, the International Conference on Social Robotics, Tsukuba, Japan, December, 2017.
- [C3] **Baraka K.**, Melo F. S., Veloso M.: *“Data-Driven Generation of Synthetic Behavioral Feature Vectors Modeling Children with Autism Spectrum Disorders”*, In Proceedings of ICDL-EpiRob’17, the Joint IEEE International Conference on Development and Learning and Epigenetic Robotics, Lisbon, Portugal, September, 2017.
- [C4] **Baraka K.**, Melo F. S., Veloso M.: *“Simulating Behaviors of Children with Autism Spectrum Disorders Through Reversal of the Autism Diagnosis Process”*, In Proceedings of EPIA’17, the Portuguese Conference on Artificial Intelligence, Porto, Portugal, September, 2017.
- [C5] **Baraka K.**, Rosenthal S., Veloso M.: *“Enhancing Human Understanding of a Mobile Robot’s State and Actions using Expressive Lights”*, In Proceedings of RO-MAN’16, the IEEE International Symposium on Robot and Human Interactive Communication, New York, USA, August, 2016.
- [C6] **Baraka K.**, Veloso M.: *“Adaptive Interaction of Persistent Robots to User Temporal Preferences”*, In Proceedings of ICSR’15, the International Conference on Social Robots, Paris, France, October, 2015.
- [C7] **Baraka K.**, Paiva A., Veloso M.: *“Expressive Lights for Revealing Mobile Service Robot State”*, In Proceedings of Robot’15, the Second Iberian Robotics Conference, Lisbon, Portugal, November, 2015. (also presented at the *AAAI Fall Symposium on AI for HRI*, Arlington, VA, USA, 2015)
- [C8] **Baraka K.**, Ghobril M., Malek S., Kanj R., Kayssi A.: *“Low Cost Arduino/Android-Based Energy-Efficient Home Automation System with Smart Task Scheduling”*, In Proceedings of International Conference on Computational Intelligence, Communication Systems and Networks (CICSyN), 2013.

BOOK CHAPTERS

- [B1] **Baraka K.***, Alves-Oliveira P.*, Ribeiro T.: *“An Extended Framework for Characterizing Social Robots”*, In Jost C., Le P ev edic B., Belpaeme T., Bethel C., Chrysostomou D., Crook N., Grandgeorge M., Mirnig N. (eds.) *Human-Robot Interaction: Evaluation Methods and Their Standardization*, Springer, 2020.

WORKSHOPS AND SYMPOSIA (peer-reviewed)

- [W1] **Baraka K.**: *“Enabling Role-Reversible Human-Robot Interaction by Leveraging Standardized Provider/Receiver Procedures”*. In the RSS’19 Pioneers Workshop, Freiburg, Germany, June, 2019.
- [W2] **Baraka K.**, Melo F. S., Veloso M.: *“Towards an Embodied Simulator of Autistic Child Behaviors: an Improved Method for Selecting Simulated Behaviors”*, In Proceedings of the Workshop on Social Robots in Therapy at HRI’18, Chicago, USA, March, 2018.
- [W3] **Baraka K.**, Melo F. S., Veloso M.: *“Embodied Robotic Visualization of Autistic Child Behaviors with Varying Severities”*, In the Workshop on Behavior Adaptation, Interaction and Learning for Assistive Robotics at RO-MAN’17, Lisbon, Portugal, September, 2017.
- [W4] **Baraka K.**, Veloso M.: *“Multi-Channel Expression of State Information in a Mobile Service Robot using Animated Lights”*, In the Workshop on Autonomous Mobile Service Robots at IJCAI’16, New York, USA, July, 2016.

EDITORIAL NOTES

- [E1] **Baraka K.**, Beights R., Couto M., Radice M.: *“Editorial note: Special issue on robots and autism: Conceptualization, technology, and methodology”*, Paladyn, Journal of Behavioral Robotics, 12(1), 297-298, De Gruyter, 2021.

TECHNICAL REPORTS

- [TR1] **Baraka K.**, Couto M., Melo F. S., Paiva A., and Veloso M.: *“An Approach for Personalized Social Interactions between a Therapeutic Robot and Children with Autism Spectrum Disorder”*, Technical Report GAIPS-TR-001-19. Group on Artificial Intelligence for People and the Society (GAIPS), Porto Salvo, Portugal, 2019.

*Equal contribution

THESES

- [T1] **Baraka K.:** “Automated Action Selection and Embodied Simulation for Socially Assistive Robots using Standardized Interactions”, Ph.D. thesis, August, 2020.
- [T2] **Baraka K.:** “Effective Non-Verbal Communication for Mobile Robots using Expressive Lights”, M.S. thesis, May, 2016.
- [T3] **Baraka K., Ghobril M., Malek S.:** “AAHA: Android/Arduino Home Automation System”, Bachelor Final Year Project, May, 2013.

INVITED TALKS and OTHER PRESENTATIONS

RSS 2021 Workshop on Robotics x Arts (invited panelist)	<i>(remote), Jul '21</i>
Anáhuac University Mexico, Mechatronics Engineering Department	<i>virtual, Apr '21</i>
Talking Robotics Seminar Series (video recording)	<i>virtual, Mar '21</i>
Robotics Portfolio Seminar	<i>Austin, TX (remote), Oct '20</i>
AI4ALL 'AI and Humanities' event	<i>virtual, Jun '20</i>
Vrije Universiteit Amsterdam, Social AI group	<i>Amsterdam, Netherlands (remote), May '20</i>
University of Maryland, Baltimore County, Mechanical Engineering	<i>Baltimore, MD (remote), May '20</i>
University of Hamburg, Dept. of Informatics	<i>Hamburg, Germany (remote), May '20</i>
TU Delft, Interactive Intelligence Group	<i>Delft, Netherlands (remote), April '20</i>
Accessibility lunch @ CMU	<i>Pittsburgh, PA, Mar '20</i>
NAO User and Developer Congress	<i>Boston, MA (remote), Feb '20</i>
The Invisible Jazz Labs lecture series (science lecture x improvisational art forms)	<i>Pittsburgh, PA, Feb '20</i>
Robots and Autism Researcher Panel (organized by ChartaCloud Robotteca)	<i>virtual, Jun '19</i>
Priberam Machine Learning Seminars (organized by Priberam Labs)	<i>Lisbon, Portugal, Apr '19</i>
Hospital Garcia de Orta Child Development Center (presented by Marta Couto)	<i>Almada, Portugal, Oct '18</i>
National Meeting of Science and Technology (invited poster)	<i>Lisbon, Portugal, Jun '18</i>
Instituto Superior Técnico, Institute for Systems and Robotics, SIPg group	<i>Lisbon, Portugal, Jun '17</i>
IBM Research Cognitive Colloquium (invited poster)	<i>Yorktown Heights, NY, Sep '16</i>
Innovation with Impact @ CMU (invited poster)	<i>Pittsburgh, PA, Apr '16</i>
AUB FEA Student and Alumni Conference.	<i>Beirut, Lebanon, May '13</i>

DEMOS

Contributed to the preparation of numerous demos on several robotic platforms (CoBot, Baxter, NAO, Pepper, etc.), including for TV station representatives such as CBS News, National Geographic, and French TV; experts from industry and academia; city mayors; children and teenagers; and even the [White House](#).

MEDIA COVERAGE

“Robótica Social” (interview – in Spanish) Ain Tech podcast (Radio Anáhuac México)	<i>May '21</i>
“Embodied Interactions from Robotics to Dance” (interview) Robohub podcast	<i>Dec '20</i>
“Interactive Robots with ‘Autism-Like’ Behaviors” (interview) Versatillist podcast	<i>May '19</i>
“CMU students to compete in Robot Art 2016 contest” The Tartan, CMU’s Student Newspaper	<i>Dec '15</i>
“Vincent van Bot: the robots turning their hand to art” The Guardian	<i>Apr '16</i>
“Kim Baraka, yin et yang” (portrait, in French) L’Orient-Le-Jour, main French language Lebanese newspaper	<i>Aug '15</i>

(more press articles mentioning my work on my [website](#).)

LANGUAGES

Fluent in English, French, and Arabic. Advanced European Portuguese.

ARTISTIC INVOLVEMENT

I have had and continue to have a very active involvement in the field of contemporary dance as a performer, teacher and creator. I have received a neoclassical dance training from the [Beirut Dance Studio](#), taught ballet to adults and underprivileged children, and performed extensively with the [Beirut Dance Company](#) and the [Pillow Projects](#), among other companies. I have started creating my own choreographic work and teaching improvisational contemporary dance. More information can be found on [the art section of my website](#).

REFERENCES

References are available upon request.