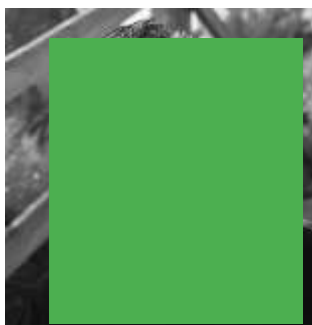## PERSONAL INFORMATION   Francesco Sapio

Francesco Sapio obtained his Master of Science in Engineering in Artificial Intelligence and Robotics degree from Sapienza University of Rome, Italy, with a couple of semesters in advance, scoring summa cum laude, after having scored the same with his Computer Science and Control Engineering degree. He is currently a researcher at the same university.

He is an Unreal and Unity3D expert, a skilled game designer, and an experienced user of the major graphics programs. He worked as an external contractor for many projects, featuring Epic Games as one of his key employers. Other works include educational games, research games and interactive virtual systems for the medical and cultural heritage sectors.

BIO

Furthermore, he is an active writer on the topic of game development. Recently, he authored the book *Hands-On Artificial Intelligence with Unreal Engine* (Packt Publishing) that deep dives in the AI systems built-in the Unreal Engine.

Francesco is also a musician and a composer, especially of soundtracks for short films and video games. For several years, he worked as an actor and dancer, where he was a guest of honor at the theatre Brancaccio in Rome. In addition, he is a very active person, having volunteered as a children's entertainer at the Associazione Culturale Torraccia in Rome.

Finally, Francesco loves math, philosophy, logic, and puzzle solving, but most of all, creating video games — thanks to his passion for game designing and programming.

WORK EXPERIENCE

2015 – present · Researcher Leading Engineer

Sapienza University of Rome, Italy, www.uniroma1.it

During this period, I work and worked on many research projects. Currently research activities involve Industry 4.0 (in Italian Impresa 4.0), Customer and Player Profiling, Digital Twins, Body Scanning for the Fashion Industry, Educational Games for high school students and cybersecurity training.

I also developed machine learning algorithms as part of the backend for the open online collaborative ideation system titled *Innovoice* (http://www.voice-project.eu and https://www.f6s.com/innovvoice.com).

In the past, I developed the whole client of the online game *Gea 2: A New Earth*, an educational game for high school students to learn concepts of physics.

As part of my personal research I have been involved in developing *Belief-Driven-Pathfinding (BDP)*, a new technique of pathfinding in videogames that has been introduced to deal with characters in videogames holding a personalized view of a dynamic changing game world. It was presented as a paper at the *DiGRA-FDG Conference 2016*. Qualitative evaluation was performed by using focus groups with real players. The outcomes prepared the platform to perform further experiments with users and identify correlations between the NPC behaviour and the impact on the gameplay. A complete framework for quantitative evaluation was built and tested.

Furthermore, I was part of the *Games@DIAG*, which is an international study group on videogames at Sapienza University of Rome. We also research in these modern AI topics:
- Belief-Driven Pathfinding
- Coordinating Dialogue Systems and Stories through Behaviour Composition
- Story Generation in PDDL Using Character Moods
- Planning for Interactive Storytelling Processes

2019 - present · External Contractor

Epic Games, USA, www.epicgames.com

The work is protected under NDA.

Inglobe Technologies, Italy, www.inglobetechnologies.com

Development in Unreal Engine of two Virtual Reality experiences for a research lab of the Hospital *Bambin Gesù* for patient with motor disabilities or reduced motor functions.

Weese, Italy, www.weese.it

Development in Unreal Engine of Virtual and Augmented Reality experience for Induustry 4.0, by previewing Weese Glasses on balconies.

Comune di Gaeta, Italy, www.comune.gaeta.lt.it/

Development in Unreal Engine of a mobile application for Android and IOS.
Further details are not disclosed yet.

Istituto Svizzero - Roma, Italy, www.istitutosvizzero.it

Development in Unreal Engine of Virtual Reality art exhibition for the *MIRACLE/LACRIME 2019* event, commissioned by Oscar De La Rosa Franco.

2015 – present	**Author**

Packt Publishing, United Kingdom, www.packtpub.com

Recently, I authored:
- *Hands-On Artificial Intelligence with Unreal Engine,* which teaches how to use and build AI systems with Unreal Engine.
- *Getting Started with Unity 5.x 2D Game Development* that takes the reader's hand and guide him/her through the amazing journey of 2D Game Development (it has been translated in other languages, including Korean)
- *Unity UI Cookbook* that teaches readers how to develop exciting and practical user interfaces for games within Unity (it has been translated in other languages including Polish)
- *What do you need to know about Unity*, a short free e-guide
- *Unity 5.x 2D Game Development Blueprints*, three projects to get started with Unity
- *Unity 5.x Game Development Projects*, a video course reflecting the content in *Unity 5.x 2D Game Development Blueprints*

You can find my Author profile on the website of the publisher here:
https://www.packtpub.com/books/info/authors/francesco-sapio

2018 - present	**Unreal Engine Meetup – Rome - Leader**

Associated with Epic Games, USA, www.epicgames.com

I support the local developer community in Rome, by promoting the culture of the Unreal Engine.

2015 – 2018	**Lead Engineer**

Player 26, International, www.player26.com
Consultation in various contexts for the design and implementation of gamified approaches.

Clients and projects include: RMIT University, Australian Council for Educational Research.(ACER), Melbourne University, University of Sydney, Global Speech Networks (GSN), and Victoria Police.

As part of Player 26, I am responsible of the software side of applications and games developed for different clients.

2015 – 2017	**Game Developer**

Dataware Games, United States of America, www.datawaregames.com

My responsibilities are:
- Game porting into Unity3D Game Engine (PC, Android and iOS),
- Adding new features to games in Unity3D Game Engine,
- Re-designing some parts of the games.

2014 – present   **Technical Reviewer**

Packt Publishing, United Kingdom, www.packtpub.com

I acted as a technical reviewer of the following books:
- Karamian V., 2018, *Building an RPG with Unity 2018 - Second Edition*, Packt Publishing, ISBN 9781788623469
- Lanham M., 2017, *Game Audio Development with Unity 5.x*, Packt Publishing, ISBN 9781787286450
- Doran P. and Casanova M., 2017, *Game Development Patterns and Best Practices*, Packt Publishing, ISBN 9781787122819
- Szauer G., 2017, *Game Physics Cookbook*, Packt Publishing, ISBN 9781787123663
- Torn A., 2017, *Mastering Unity 5.x, Packt Publishing*, ISBN 9781785880742
- Torn A., 2016, *Unity 5.x By Example, Packt Publishing*, ISBN 9781785888380
- D'Aoust K., 2014, *Unity Game Development Scripting*, Packt Publishing, ISBN 9781783553631

I acted as a technical reviewer of the following video courses:
- Doran P., 2017, *Building an FPS Game with Unity and UFPS [Video]*, Packt Publishing, ISBN 9781787123113
- O'Malley K., 2017, *Enhancement with Unity UI Advanced [Video]*, Packt Publishing, ISBN 9781788297394

2014 – 2017   **Software Engineer**

Niuco srl, Italy, www.radiohotelroma.com

I developed a hotel management system and built up websites for hotels with booking engines integrated to the major OTAs portals within the context of Industry 4.0. The integrated system manages:
- Tableau: mapping of reservations from all sales channels (direct, website, OTAs, ...);
- Invoices: issuance and storage of invoices;
- Insertion and storage of the guests, to be reported daily to the police;
- Analysis and Reporting: control panel with the data of the bookings, invoices, receipts, with the possibility of OLAP analysis and data mining, and processing forecast;
- Email push: automatic submission to the receipt of any reservation of different email templates for push services, and analysis of responses.

2016   **Project Collaborator**

CINI - Consorzio Interuniversitario Nazionale per l'Informatica, Italy, www.consorzio-cini.it

I designed and realised a game in Unity3D to boost up energy savings in buildings within the context of the *GreenerBuildings* project.

2016   **External Consultant**

Sapienza University of Rome, Italy, www.uniroma1.it

Codice Procedura n. 23/prest.occ./2016
I designed and realised a demonstrator of advance pathfinding techniques, which has been presented during the *OpenDiag* event (open.diag.uniroma1.it) on 9th March 2016.

2016 Game Development Consultant

Entertainment Game Apps, Inc, United Kingdom, www.egameapps.com

Providing technical assistance in Unity and C# during the development of the (successfully funded by Kickstarter) game *Prosperity – Italy 1434*.

2016 Research assistant

Royal Melbourne Institute of Technology (RMIT), Australia, www.rmit.edu.au
Assisting PhD Student Lauren S. Ferro, in developing Ani as part of her doctoral research The Anima Project. Ani is a game recommendation system that provides the user with game recommendations based on some criteria, such as platform, genre and types of components in games.

EDUCATION AND TRAINING

2015 - 2017 Master of science in Engineering in AI and Robotics
Summa cum laude

Sapienza University of Rome (Italy)

Thesis on Design, Development and Validation of a Serious Game with Unity 3D for Technology Enhanced Learning Environments.

I've acquired the ability to design and implement AI and robotic systems, including interdisciplinary skills to manage complex projects. Typical activities are in the following categories:
- Design and realization of advanced software systems based on knowledge-based and multi-agent technologies;
- Design and realization of systems for the movie and videogame industries;
- Design and coordination of research and development teams;
- Design and realization of robotic systems for service and industrial applications, including for safety and security, space, home, elderly people, medicine;
- Design and realization of video systems for surveillance and monitoring of environment, production and services;
- Planning, supervision, design and implementation, in interdisciplinary teams, of innovative applications in information technology or related areas;
- Technological transfer of research results and technological advancements;
- Human resources training for information technology.

Furthermore, I've followed integrative activities in:
- Artificial Intelligence applied to videogames;
- Math models for videogames;
- Research in videogame design and development.

2012 - 2015	**Bachelor of Science in Engineering in Computer Science and Control Engineering**

Summa cum laude

Sapienza University of Rome (Italy)

Thesis on *Belief-Driven Pathfinding in Videogames*

During the degree, I acquired:
- Extensive knowledge of the functioning of complex systems that characterize the information society and the principles and paradigms of operation and design of information processing systems and systems operating in autonomy.
- Specific competences in the field of Computer Engineering and Automation Engineering.
- Both methodological and practical expertise, cognitive tools, and knowledge of professional and ethical responsibilities.

And I did:
- Contribute to the design of innovative solutions using dedicated techniques and tools to assess the impact of proposed solutions in the economic and social context.
- Develop a strong background in all the basic sciences (maths, physics, chemistry) and engineering sciences.
- Build capabilities to interact with specialists in all areas of engineering and economics, with other professionals in the information sector.
- Perform analysis, design and management of hardware / software IT systems and IT applications in various service and production sectors.
- Perform analysis and design of autonomous systems: e.g. robotic systems, aerial and space navigation systems, automated systems for the production and management of goods, services and environmental resources, systems for biomedical control analysis.

PERSONAL SKILLS

Mother tongue(s)   Italian

Other language(s)

UNDERSTANDING		SPEAKING		WRITING
Listening	Reading	Spoken interaction	Spoken production	
C2	C2	C2	C2	C2

English

Levels: A1/A2: Basic user - B1/B2: Independent user - C1/C2 Proficient user
Common European Framework of Reference for Languages

Communication skills
- **Good communication and team management** skills gained from managing employees and teams from a range of different backgrounds, locations and time zones, in addition to years of experience working with people of various ages, demographics, and cultural backgrounds.
- **Team work**: I am involved in many projects with different companies around the world, cooperate with international teams, and I am actively engaged in the *Games@DIAG* initiative (an international study group on videogames at Sapienza University of Rome).
- **Intercultural skills**: I spent three months on a research fellowship at the RMIT in Melbourne (Australia), and I worked with publishers from the UK and the US.
- **Experience in presentations** (i.e. conferences, interviews, and panels) in both digital and physical locations.

Organisational / managerial skills	▪ I built up my organisational skills while volunteering in youth summer camps with non-profit organizations acting as children supervisor and entertainer ▪ **Leadership:** by coordinating teams and developers during my experiences as Software Engineer, Game Developer and Leading Engineer. ▪ **Organisation:** from running events, managing clients, deadlines and various workloads and projects. ▪ **Efficiency:** able to prioritise tasks, lead a project to completion, as well as dealing with various managerial levels and departments. Able to plan for and meet deadlines successfully.
Job-related skills	▪ Able to use various technologies and medias (digital/physical) to find ways to solve problems. ▪ Able to adapt to any changes in circumstances and environments easily. This has been learnt from working in a wide range of different environments with many kinds of demographics. ▪ Open-minded and willing to try/experience new tasks, environments, situations. ▪ Efficient with managing many tasks and projects simultaneously (and within different time zones around the world). ▪ Competent in task and project management. ▪ Able to work autonomously, with groups, and alone. ▪ Prepared to work beyond the necessary requirements to achieve the best outcome for any project or aspect of the job's requirement.
Computer skills	▪ Excellent programming skills in Java and C# ▪ Excellent command and programming of the Unity 3D game engine and the Unreal 4 game engine (both Blueprint and C++) ▪ Very good programming in C and C++ ▪ Good command of Microsoft Office™ tools ▪ Good command of image processing tools (Adobe Photoshop, Adobe Illustrator, Adobe inDesign) ▪ Good command of video processing tools (Adobe Premiere, Adobe After Effects, Adobe SpeedGrade, Pinnacle Studio) ▪ Good programming skills in Wordpress ▪ Good programming skills in HTML, Javascript and PHP ▪ Good command of different Operating Systems (Windows 2000, XP, Vista, 7, 8, 10, Unix, MacOSX) ▪ Good programming skills in Basic
Driving licence	A, B (Car and Motorcycle)

ADDITIONAL INFORMATION

Publications
- Lauren S. Ferro, Francesco Sapio Another Week at the Office (AWATO) – an Interactive Serious Game for Threat Modeling Human Factors - HCI International
- Lauren S. Ferro, Francesco Sapio, Massimo Mecella, Marco Temperini, Annalisa Terracina Intelligent Pedagogic Agents (IPAs) in GEA2, an educational game to teach STEM topics MIS4TEL 2020
- Sapio, F. 2019. *Hands-On Artificial Intelligence with Unreal Engine*. Packt Publishing (Birmingham, UK), ISBN 9781788835657
- Agostinelli, S., Maggi, F. M., Marrella, A., & Sapio, F. (2019). Achieving GDPR Compliance of BPMN Process Models. International Conference on Advanced Information Systems Engineering, 10–22.
- Sapio F. 2017, *Getting Started with Unity 5.x 2D Game Development*, Packt Publishing (Birmingham, UK), ISBN 139781784397173
- Sapio F. and Saher A. 2017, *Unity 5.x Game Development Projects [Video]*, Packt Publishing (Birmingham, UK), ISBN 139781787125513
- Terracina A., Fabiani F., Ferro L.S., Litardi D., Sapio F., Zendri G., Mecella M. 2016, Conquering an Exo-planet Through the use of a Virtual Role Playing Game Assisted by an Emotionally Intelligent Pedagogical Agent. *Procedings of ECGBL 2016 : The 10th European Conference on Games Based Learning (Paisley, Scotland, 6-7 October 2016), 666-675*
- Sapio F. and Vassos S. 2016, BDP-Pac-Man: Evaluating Belief-Driven Pathfinding on Player Experience, *Proceedings of the Digital Games Research Association (DiGRA) and the Foundations of Digital Games conferences (FDG) (Dundee, Scotland, 1-6 August 2016)*
- Sapio F. 2016, *What you need to know about Unity 5*, Packt Publishing (Birmingham, UK)
- Sapio F. and Saher A. 2016, Unity 5.x 2D Game Development Blueprints, Packt Publishing (Birmingham, UK), ISBN 139781784393106
- Sapio F. 2015, Unity UI Cookbook, Packt Publishing (Birmingham, UK), ISBN 139781785885822

Thesis for Master of Artificial Intelligence and Robotics:
- Sapio F, 2017, Design, *Development and Validation of a Serious Game with Unity 3D for Technology Enhanced Learning Environments*, Sapienza University of Rome

Thesis for Bachelor of Science:
- Sapio F, 2015, *Belief-Driven Pathfinding in Videogames*, Sapienza University of Rome

Presentations
- 2017, Interview by *Best Programming Books* (http://bestprogrammingbooks.com/interview-francesco-sapio-author-getting-started-unity-2d-game-development-second-edition)
- 2016, Panellist during the *OpenDIAG* event (open.diag.uniroma1.it) on March 2016 presenting advance pathfinding techniques

Reviews   I acted as Technical reviewer of the following books:
- Karamian V., 2018, *Building an RPG with Unity 2018 - Second Edition*, Packt Publishing, ISBN 9781788623469
- Lanham M., 2017, *Game Audio Development with Unity 5.x*, Packt Publishing (Birmingham, UK), ISBN 9781787286450
- Doran P. and Casanova M., 2017, *Game Development Patterns and Best Practices*, Packt Publishing (Birmingham, UK), ISBN 9781787122819
- Szauer G. 2017, *Game Physics Cookbook*, Packt Publishing (Birmingham, UK), ISBN 139781787123663
- Thorn A. 2017, *Mastering Unity 5.x*, Packt Publishing (Birmingham, UK), ISBN 139781785880742
- Thorn A. 2016, *Unity 5.x By Example*, Packt Publishing (Birmingham, UK), ISBN 139781785888380
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- O'Malley K., 2017, *Enhancement with Unity UI Advanced [Video]*, Packt Publishing (Birmingham, UK), ISBN 9781788297394

Honourable Mention   Ferro L.S. 2016, *Gamification with Unity 5.X*, Packt Publishing (Birmingham, UK), ISBN 139781786463487