Cristina Segalin

SENIOR RESEARCH SCIENTIST, COMPUTER VISION

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Research Interests & Vision

My interest is at the intersection of Machine Learning, Computer Vision, Machine Perception, Human Sciences, Social Signal Processing, Affective Computing and Creative AI. I am interested in the potential of AI systems to **develop new forms and processes for human creativity** to use them as non-human collaborators and empower creative expression. I am also interested in building integrated systems that can sense human (social, verbal and non-verbal) behavior in order to **understand, model and synthesize social interactions and affect** to provide computers with similar abilities.

Currently at Netflix, I develop Computer Vision, Machine Learning algorithms to analyze and transform raw media sources to **generate and recommend media assets**, such as artworks and videos. I build and deploy algorithms that assist and **empower editors and creatives** in their daily workflows in generating media assets. The cross-functional work includes research, design, implementation, A/B testing, and deploying of algorithms and systems into production. Other areas of research include **algorithmically assisting the production and post-production** of our original content.

I have 5+ years of experience in developing and commercializing AI/ML solutions, 3+ year experience leading projects. My efforts led to 20+ high impact publications, 10+ invited talks, multimedia coverage and 1 patent.
My work has been featured in IEEE Transactions on Affective Computing, CVIU, CVPR, ACM Multimedia, ACCV.

Other areas I work on: Computational Aesthetics, Social Media Analysis, Object Detection/Recognition, Pose Estimation, Action Recognition, Biometrics, Re-Identification, Neuroscience, Computational Ethology, Human-Computer Interaction, Virtual/Augmented Reality.

Research & Work Experience

Senior Research Scientist, Computer Vision: Netflix
Los Gatos, CA, USA

NETFLIX - STUDIO MEDIA ALGO DSE
Aug. 2020 - Present

- Topics: Machine Learning, Deep Learning, Computer Vision, Social Signal Processing, Affective Computing, Creative AI, Generative AI, Personalization.
- Conceptualization, design, implementation, validation, deployment of CV and ML algorithmic solutions for the creation of artworks and video assets using interpretable image representation.
- Conceptualization, design, implementation, validation, deployment of CV and ML algorithmic solutions integrated in internal tool which have proven effective in lifting title performance.
- Designed, implemented and productized video visual search solution for internal creative tools using interpretable video representation.
- Run offline experiments and build online A/B tests to run in production systems.
- Improved internal ML and CV infrastructure platforms implementing technical and optimized solutions across different dimensions.
- Designed and built data annotation workflows for different projects.
- Work cross-functionally with engineers, scientists, creative producers, and leaders across teams, to help define and prioritize problem requirements.
- Explored and trained generative AI models (GANs, VAEs, diffusion models).
- Organizer of internal generative AI workshop.
- Winner of several internal hackathon editions.

Research Scientist: Walt Disney Imagineering R&D
Glendale, CA, USA

DISNEY RESEARCH
Aug. 2018 - Aug. 2020

- Topics: Machine Learning, Deep Learning, Computer Vision, Social Signal Processing, Affective Computing, Creative AI, Generative AI, Human Computer Interaction, Robotics.
- Delivered Computer Vision components embedded into ROS platform as object detector/recognition, smile intensity, emotions classifiers.
- Delivered real-time AI/ML solutions with SOTA accuracy.
- Implemented and explored different deep generative models for creative AI and performance for virtual character platform.
- Collaborated with a team of 15+ international scientists to create an end-to-end virtual character platform.
- Collaborated with a team of 10+ international scientists to create an end-to-end system to sense people and surrounding environment.
- Collaborated with different teams to collect datasets for ML tasks.
- Organizer of EMERGENT workshop at Affective Computing & Intelligent Interaction 2019.
- Mentored several international students during their internship.
- Organizer of social events for Disney Research LA and interns activities.
- Participated in internal hackathon: developed a system to control a device's navigation and behavior using physiological signal.
- Collaborated on 1 patent.
- Taught AI/ML class to Walt Disney Imagineering executives.

Postdoctoral Scholar: CalTech
Pasadena, CA, USA

CALTECH (CALIFORNIA INSTITUTE OF TECHNOLOGY)
Aug. 2016 - Aug. 2018

- Topics: Machine Learning, Deep Learning, Computer Vision, Computational Ethology, Neuroscience
- Advisor: Pietro Perona
- Conceptualization, design, implementation, validation, deployment of software to analyze mice social interactions in videos. Designed and implemented Deep Learning based mice detector, pose estimator, tracker and behavior classifier in Tensorflow. The system is optimized and integrated into a GUI used by the Computational Neurobiology Lab at Caltech. The system also allows to train new behavior classifiers using the GUI interface and few annotation samples.

Research Intern: Disney Research
Pittsburgh, PA, USA

DISNEY RESEARCH
Feb. 2016 - Apr. 2016

- Topics: Machine Learning, Computer Vision, Psychology, Sociology
- Advisor: Maarten Bos
- Developed a system to predict personal appeal of marketing images using computational methods. Extracted features from images, applied ML algorithms to predict the personality of consumers to which the image appeals most. We showed that image-person fit adds incremental predictive power over the images' general appeal when predicting consumers' attitudes and purchase intentions.

Research Assistant: School of Computer Science
Birmingham, UK

UNIVERSITY OF BIRMINGHAM
Oct. 2014 - Dec. 2014

- Topics: Machine Learning, Computer Vision, Social Media Analysis
- Advisor: Mirco Musolesi
- Designed and implemented system to predict retweets from images and social network on Twitter, showing which features have most impact in the retweet process and how this study can be used to design viral tweets.

Research Assistant: School of Computing Science
Glasgow, Scotland

UNIVERSITY OF GLASGOW
Apr. 2013 - Aug. 2013

- Topics: Machine Learning, Computer Vision, Social Media Analysis, Psychology, Sociology, Perception, Personality
- Advisor: Alessandro Vinciarelli
- Designed and implemented system to predict self and perceived personality traits from Flickr image preferences. cross-culturally

Research Assistant: IIT
Genova, Italy

IIT (ITALIAN INSTITUTE OF TECHNOLOGY)
Jun. 2012 - Nov. 2012

- Topics: Social Media Analysis
- Advisor: Vittorio Murino
- Built API to scrape and query Pinterest and Flickr Social Media before the official APIs were available.

Research Assistant: VIPS Lab
Verona, Italy

UNIVERSITY OF VERONA
Feb. 2012 - Apr. 2012

- Topics: Machine Learning, Computer Vision, Social Media Analysis
- Advisor: Marco Cristani
- Designed and implemented system for re-identification of subject through the way they chat on Skype. Collected the dataset, design and extracted low level features from turn-taking conversations, implemented machine learning method for re-identification. We showed the importance of the selected features for the purpose of re-identification.

Research Assistant: VIPS Lab
Verona, Italy

UNIVERSITY OF VERONA
Sep. 2010 - Dec. 2010

- Topics: Machine Learning, Computer Vision
- Advisor: Umberto Castellani
- Designed, implemented and delivered Face Recognition system and device used to grant access to the university Visual Computing Lab.

Education

Ph.D., Computer Science - Doctoris Europaei
Verona, Italy

UNIVERSITY OF VERONA
Jan. 2013 - Dec. 2015

- Thesis title: A Social Signal Processing Perspective on Computational Aesthetics: Theories and Applications.
- Topics: Social Signal Processing, Machine Learning, Computer Vision, Computational Aesthetics, Social Media Analysis, Biometrics, Image Processing

M.Sc., Computer Engineering and Computer Science - Visual Computing Curriculum
Verona, Italy

UNIVERSITY OF VERONA
Oct. 2010 - Jul. 2012

- Thesis title: Statistical Analysis of Skype Conversations: Recognizing Individual by their Chatting Style.
- Topics: Re-identification, Social Signal Processing, Biometrics

B.Sc., Multimedia Information Technology
Verona, Italy

UNIVERSITY OF VERONA(1ST IN ITALY OFFERING THIS DEGREE)
Oct. 2007 - Dec. 2010

- Thesis title: Sistema di Rilevamento Automatico e Riconoscimento Volti: Aspetti Metodologici e Pratici.
- Topics: Face Recognition, Re-identification

High School Diploma in Accounting and Expert Programmer
Thiene, Italy

AULO CECCATO
Sep. 2002 - Jul. 2007

Fellowships & Awards

2015	**Best Poster Award**, International Computer Vision Summer School best poster presentation.	*ICVSS*
2013	**Erasmus Placement**, Grants for PhD students for placements in companies, facilities in one of the countries participants to the LLP program.	*Verona, Italy*
2013-2015	**PhD Scholarship**, University of Verona supported my Ph.D.	*Verona, Italy*

Publications

Published **20+ peer-reviewed publications** and **1 patent**: conference papers and short/workshop papers in the venues of CVPR, ACII, APS, ACMMM, WIML, ICMI, ACCV, ICIP1, ACM MM BNI, CIARP, AVSS, ICPR, WIAMIS, and journal papers IEEE Transaction on Affective Computing, IEEE Transaction on Information Forensics and Security, Computer Vision Image Understanding, Journal of Consumer Psychology, ELife Psycology

Conference Papers

[C15] S. Ardeshir, **C. Segalin**, and N. Kallus. "Estimating Structural Disparities for Face Models". *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2022

[C15] P. Witzig, R. J. kennedy, and **C. Segalin**. "Smile Intensity Detection in Multiparty Interaction using Deep Learning". *Proceedings of the International Conference on Affective Computing and Intelligent Interaction*, 2019

[C15] **C. Segalin**, F. Celli, B. Lepri, M. Kosinski, M. Cristani, and L. Polonio. "What your Facebook Profile Picture Reveals about your Personality: A Feature-based Approach". *ACM Multimedia*, 2017

[C15] **C. Segalin**, A. Perina, and M. Cristani. "Biometrics on Visual Preferences: a "Pump and Distill" Regression Approach". *IEEE International Conference on Image Processing*, 2014

[C15] **C. Segalin**, A. Perina, and M. Cristani. "Personal Aesthetics for Soft Biometrics: a Generative Multi-resolution Approach". *Proceedings of the International Conference on Multimodal Interaction*, 2014

[C15] **C. Segalin**, A. Perina, and M. Cristani. "Recognizing People by Their Personal Aesthetics: a Statistical Multi-level Approach". *Proceedings of the Asian Conference on Computer Vision*, 2014

[C15] M. Cristani, A. Vinciarelli, **C. Segalin**, and A. Perina. "Unveiling the multimedia unconscious: Implicit cognitive processes and multimedia content analysis". *Proceedings of the ACM international conference on Multimedia*, 2013

[C15] P. Lovato, A. Perina, D. S. Cheng, **C. Segalin**, N. Sebe, and M. Cristani. "We like it! Mapping image preferences on the counting grid." *IEEE International Conference on Image Processing*, 2013

[C15] A. Pesarin, M. Tait, A. Vinciarelli, **C. Segalin**, G. Bilancia, and M. Cristani. "Generative modelling of dyadic conversations: characterization of pragmatic skills during development age". *Multimodal Pattern Recognition of Social Signals in Human-Computer-Interaction*, 2013

[C15] G. Roffo, M. Cristani, F. Pollick, **C. Segalin**, and V. Murino. "Statistical Analysis of Visual Attentional Patterns for Video Surveillance". *Progress in Pattern Recognition, Image Analysis, Computer Vision, and Applications*, 2013

[C15] G. Roffo, **C. Segalin**, A. Vinciarelli, V. Murino, and M. Cristani. "Reading between the turns: Statistical modeling for identity recognition and verification in chats". *IEEE International Conference on Advanced Video and Signal Based Surveillance*, 2013

[C15] **C. Segalin**, A. Pesarin, A. Vinciarelli, M. Tait, and M. Cristani. "The expressivity of turn-taking: Understanding children pragmatics by hybrid classifiers". *International Workshop on Image Analysis for Multimedia Interactive Services*, 2013

[C15] M. Cristani, G. Roffo, **C. Segalin**, L. Bazzani, A. Vinciarelli, and V. Murino. "Conversationally-inspired stylometric features for authorship attribution in instant messaging". *Proceedings of the International Conference on Multimedia*, 2012

[C15] M. Tait, M. Cristani, A. Pesarin, **C. Segalin**, and G. Bilancia. "Lo sviluppo delle competenze pragmatica tra i 3 e gli 8 anni". *XXI Congresso Nazionale AIRIPA, Bari*, 2012

Journal Papers

[J7] **C. Segalin**, J. Williams, T. Karigo, M. Hui, M. Zelikowsky, S. J.J., P. Perona, D. Anderson, and A. Kennedy. "The Mouse Action Recognition System (MARS) software pipeline for automated analysis of social behaviors in mice". *eLife*, 2021

[J7] S. C. Matz, **C. Segalin**, D. Stillwell, S. R. Müller, and M. W. Bos. "Predicting the Personal Appeal of Marketing Images Using Computational Methods". *Journal of Consumer Psychology*, 2019, 29.3, (pp. 370–390)

[J7] M. Qiao, T. Zhang, **C. Segalin**, S. Sam, P. Perona, and M. Meister. "Mouse Academy: high-throughput automated training and trial-by-trial behavioral analysis during learning". *BioRxiv*, 2018

[J7] **C. Segalin**, D. S. Cheng, and M. Cristani. "Social Profiling through Image Understanding: Personality Inference using Convolutional Neural Networks". *Computer Vision and Image Understanding*, 2016

[J7] **C. Segalin**, A. Perina, M. Cristani, and A. Vinciarelli. "The pictures we like are our Image: Continuous mapping favorited pictures into self-assessed and attributed personal traits". *IEEE Transactions on Affective Computing*, 2015, 8(pp. 268–285)

[J7] P. Lovato, M. Bicego, **C. Segalin**, A. Perina, N. Sebe, and M. Cristani. "Faved! Biometrics: Tell Me Which Image You Like and I'll Tell You Who You Are". *IEEE Transactions on Information Forensics and Security*, 2014, 9.3, (pp. 364–374)

Patents

[P2] S. D. Lombardo, **C. Segalin**, L. Chen, R. D. Navarathna, and S. M. Mandt. *Automated Content Evaluation Using a Predictive Model*. 18-DIS-326-MEDIA-US-UTL, 2018

Tech Report

[T2] **C. Segalin**, A. Vinciarelli, M. Cristani, and M. Musolesi. *Visual Contagion: Understanding the Influence of Textual, Visual and Social Cues on Information Propagation in Twitter*, 2014

Press & Media

Netflix Technology Blog, New Series: Creating Media with Machine Learning ⚭
Netflix Technology Blog, Discovering Creative Insights in Promotional Artwork ⚭
Netflix Technology Blog, Causal Machine Learning for Creative Insights ⚭
DMN, 5 Lessons to Learn from a Disney Research Scientist.
Street Fight, Disney's Deep Dive on Personality Research, and Its Potential Implications for Brand Marketers.
Contagious, Opinion / What Machine Vision means for creativity.
Wikipedia, Social Profiling

Talks & Presentation

Dec. 2021	**NeurIPS**, Computer Vision at Netflix.	*Virtual*
Feb. 2018	**Legendary Analytics**, Social Profiling through Image Understanding.	*Boston, MA*
Feb. 2018	**MIT Media Lab**, Unveiling the Multimedia Unconscious: Implicit Cognitive Processes and Personality Inference through the Images we Like	*Boston, MA*
Feb. 2018	**MIT Media Lab**, Social Profiling through Image Understanding	*Boston, MA*
Oct. 2017	**ACM Multimedia**, What your Facebook Profile Picture Reveals about your Personality: A Feature-based Approach	*Mountain View, CA*
May. 2018	**Association for Psychological Science Convention**, Social Profiling through Image Understanding	*Boston, MA*
Dec. 2016	**Neurips**, Social Profiling through Image Understanding	*Barcelona, SP*
Feb. 2016	**CalTech**, Computational Aesthetics for Multimedia, a Social Signal Processing Perspective	*Pasadena, CA*
Oct. 2015	**UNSW School of Psychology**, Computational Aesthetics for Multimedia	*Sydney, AU*
Oct. 2015	**UTS**, Computational Aesthetics for Multimedia	*Sydney, AU*
Oct. 2015	**NICTA**, Computational Aesthetics for Multimedia	*Canberra,, AU*
Jul. 2015	**ICVSS - Best poster award**, Computational Aesthetics for Multimedia: a Social Signal Processing Perspective	*Sicily, IT*
Nov. 2014	**ACCV**, Recognizing People by Their Personal Aesthetics: a Statistical Multi-level Approach	*Singapore, SG*
Oct. 2014	**ICIP**, Recognizing People by Their Personal Aesthetics: a Statistical Multi-level Approach	*Paris, FR*

Service & Leadership

Academic Reviewer
- Conference: ACCV, ICCV, CVPR, ECCV, NeurIPS, CHI, ICML, ICLR, CVIU
- Journal: PLOS ONE, NEUROCOM, IEEE Multimedia, Affective Computing, AIMed

Program Committee
- 3rd Workshop on Media Analytics for Societal Trends at ACM MM
- 2nd Workshop on Media Analytics for Societal Trends at ACM MM

EMRGENT Workshop
Cambridge, UK

ORGANIZER (WORKSHOP AT AFFECTIVE COMPUTING & INTELLIGENT INTERACTION 2019)
Sep. 2019
- Lead the effort to organize the first workshop on Emotions and Emergent States in Groups.
- Some of the top affective computing scientists attended the workshop.

Disney Research Annotation Team Management
Disney Research

MANAGER
- Lead team of annotators performing tasks for NLP, Computer Vision and other projects
- Coordinated annotators' work schedule based on projects need
- Coordinated communication between annotators and project leaders

Member
- Association for Computing Machinery (ACM)
- IEEE

Mentorship & Teaching

Tutorial on Denoising Diffusion-based Generative Modeling
Los Angeles, California, USA

NETFLIX INTERNAL TUTORIAL
Feb. 2023
- Foundation of core generative modeling, with focus on denoising diffusion-based models
- Explored and discussed technial details of most popular diffusion models
- Informed and educated producers and leaders on how GAI can be levaraged at Netflix

AI/ML Course (WDI R&D)
Glendale, California, USA

WALT DISNEY IMAGINEERING COURSE TO EXECUTIVES
July. 2019
- Introduced concepts of AI/ML and their application to WDI R&D problems
- Showcase of everyday ML use and future projects opportunities
- Guided executives and leaders to understand how ML can help them to make decisions

Deep Learning Applications
Verona, Italy

DEPT. OF COMPUTER SCIENCE, UNIVERSITY OF VERONA
Oct. 2014
- Showcase of everyday DL use and applications

Introduction to Deep Learning
Verona, Italy

DEPT. OF COMPUTER SCIENCE, UNIVERSITY OF VERONA
July. 2014
- Introduced concepts and history of Deep Learning
- Introduced types of Deep Learning Networks (CNN, RNN, Autoencoders), Backprop

2019	**Women in Machine Learning**, NeurIPS	*Vancouver, Canada*
2019	**Women in Computer Vision**, CVPR	*Lonch Beach, CA*
2018	**Women in Machine Learning**, NeurIPS	*Montreal, Canada*

Research Mentor

Disney Research — *Glendale, CA*
MS Student: Bryan J. Loh
Undergrad Student: Philine Witzig

CalTech — *Pasadena, CA*
MS Student: Jennifer Sun
Undergrad Student: Zack Polizzi, David Mace

University of Verona — *Verona, Italy*
MS Student: Francesca Zerbato, Luca Brunelli, Marco Fanini, Walter Riviera, Elena Boschetti

Open Source Datasets & Code

PsychoFlickr: Big-Five OCEAN personality traits and favorite images dataset ⚲
- 300 Subjects, 60000 images, both self and perceived personality traits
- Code to extract visual features (Matlab)

FavedBiometrics: Favorite images from Flickr ⚲
- 500 Subjects, 100000 Flickr favorite images
- Code to extract visual features (Matlab)

Mice Action Recognition System (MARS)
- 10000 top and front frames with pose keypoints annotations
- 80 10mins videos of mice having social interactions
- Code to train mice detector, pose estimation and behavior classifier (Tensorflow, scikit-learn), PyQt GUI interface

Skills

Mentor, Project Lead & Researcher, Hands on experience conducting research and leading projects to develop, optimize, deploy and ship to production algorithms and systems. Set technical and creative direction to pursue +2 years projects. Guided multidisciplinary researchers and engineers. — *Lead*

Qualitative & Quantitative Researcher, Rapid Prototyping, Academic Writing, Software and System Developer, Computer Vision, Machine Learning, Deep Learning (CNN, RNN, GAN, VAE, Transformers, Diffusion Models), Image Processing, Data Science, Infrastructure/System dDsign and Optimization, Data Annotation Pipelines, Web/UI/UX Design and Development. — *Technical*

Dynamic Researcher, Inclined to analyze both theoretical and practical problems, solving them by employing innovative and creative thinking, rapid prototyping. Effective collaboration in cross-functional teams, strong communication skills. Strong abilities to blend in new contexts, maintain productivity and quality standards while managing multiple projects concurrently, agility in transitioning between projects, efficiently allocating resources, adjusting strategies and effectively managaing shifting priorities. Eager to learn and develop new skills. — *Soft*

Coding: Python, C++, C#, R, Matlab, SQL
ML Tools: PyTorch, Tensorflow, Keras, SciPy, Scikit, OpenCV, Pandas, Ray
Creative Tools: Adobe Creative Suite, DaVinci, Automatic1111, Midjourney
Framework: Metaflow, AWS (S3, EC2, SageMaker)
Web: HTML5, CSS, JavaScript, NodeJS, Flask, Gradio
Misc: Git, LaTeX, ARToolkit, Flickr API, Twitter API, Google API, LucidChart
OS: Windows, Linux, Mac OS, ROS

SW/HW