

Media Futures.

Research Centre for Responsible
Media Technology & Innovation

Annual Report
2022



Norwegian Centre
for Research-based
Innovation

Content

2	Partners
5	Words from the Director
6	Our Organisation
7	About MediaFutures Research Centre
8	Basic Facts
12	Understanding Media Experiences
14	User Modeling, Personalisation & Engagement
16	Media Content Production & Analysis
18	Media Content Interaction & Accessibility
20	Norwegian Language Technologies
22	Prototypes and Demos
25	Recruitments in 2022
26	International Cooperation
28	Communication and Dissemination Activities
30	Publications
32	Personell
35	Accounts

Host Organisation



Research Partners



User Partners



Ethics Committee



WP Advisory Committee



Affiliates



Associates



CEDAS
Center for Data Science



Industry Cluster Partner



Media City
Bergen

Funding Agency



The Research
Council of Norway

Contact us:

**Professor Christoph Trattner,
Centre Director**

Phone: +47 453 96 180

Email: Christoph.Trattner@uib.no

Website: <https://mediafutures.no/>

Newsletter: <https://mediafutures.no/newsletter-archive/>

Email: office@mediafutures.no

Postal address:

SFI MediaFutures
Department of Information
Science and Media Studies
Faculty of Social Sciences
University of Bergen
P.O. Box 7802
N-5020 Bergen

Visiting address:

Media City Bergen
Lars Hilles gate 30
5008 Bergen
Norway

Graphic Layout:

Daniela Lipcika
Adapted from Carl Christian Andersen



Photo: Niklas Hart

Words from the Centre Director

The year 2022 at MediaFutures was marked by surging vitality and mobility. The centre's researchers, partners, students, and administrative staff continued to evolve to meet challenges, and to deliver high-quality work.

In 2022, we had new staff members joining the centre in scientific and administrative roles. Two PhD candidates Khadiga Seddik and Jeng Jia-Hua joined us to advance research on recommender systems. 9 research assistants were hired to support the centre's six work packages. Finally, Ola Roth Johnsen took on the important role of Administrative Coordinator to help leverage all activities at the Centre from an administrative perspective.

In the second year of the centre's operation, our scientific staff have published 26 research papers in some of the top-tier academic outlets. Moreover, we had a significant amount of representation in scientific conferences, won prizes for our papers, and were invited to provide op-eds and expert opinions in Norwegian and international media outlets.

Our team has also worked on making science tangible. To this end, we have created 12 demos and tools, and we were delighted to see that this serves as an effective way to challenge our researchers, and to interact with our partners regarding research and its application.

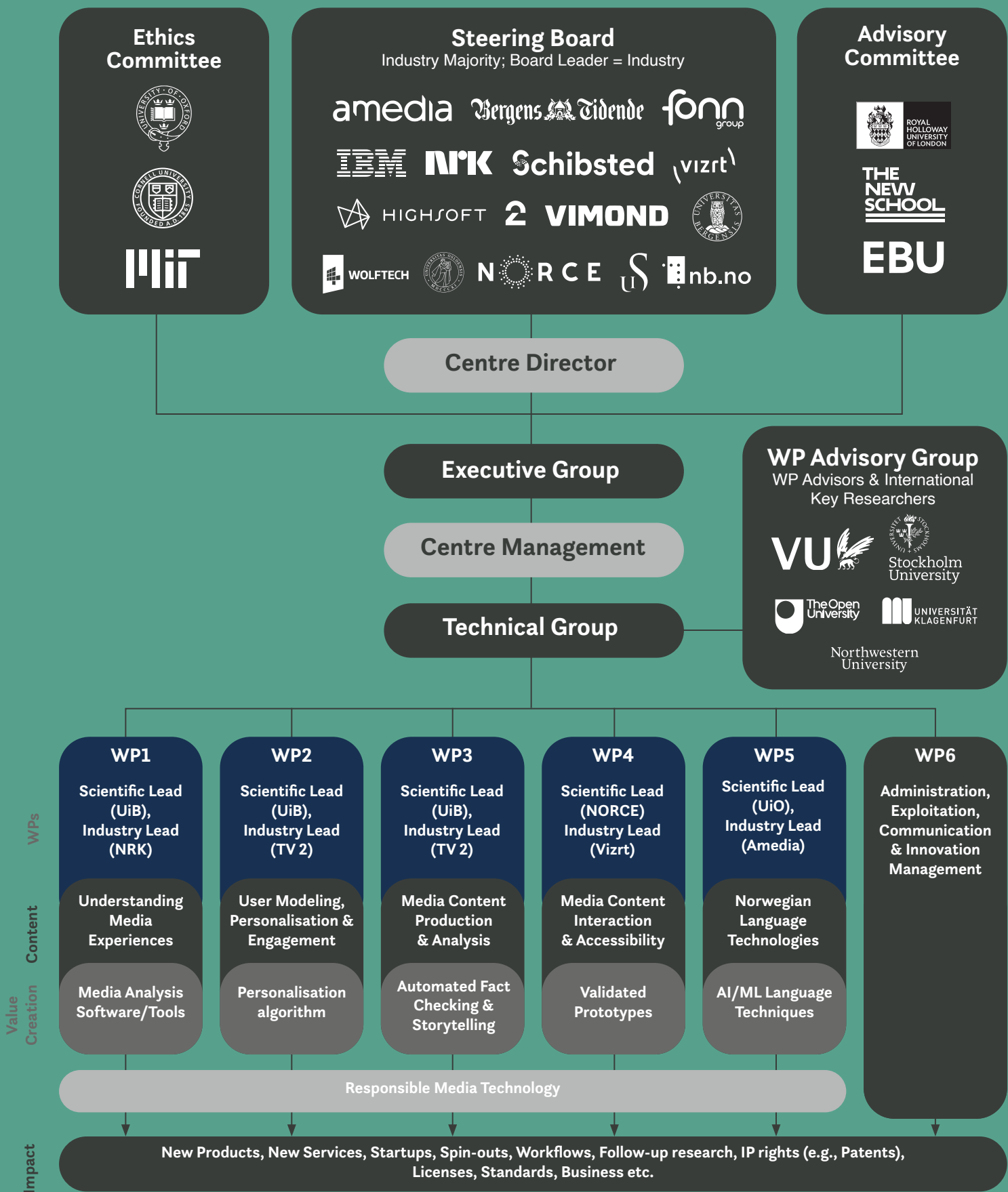
A perfect venue to showcase the demos and prototypes, an overview of which you can find at the end of this Annual Report, was our [yearly conference](#). Organized on November 15/16, the Annual Meeting gathered over 130 guests, featured three keynote speakers and inspired many conversations and exchange of ideas.

Lastly, I was thrilled to have our centre welcome several visiting researchers and master students from Germany, Switzerland and Italy. Facilitating physical meetings with industry partners was also possible, and constituted a perfect way to foster collaboration.

I want to thank everyone who contributed to such successful and fruitful year. Last, but not least, allow me to invite you to read the 2022 Annual Report that chronicles our growth and achievements.



Our Organisation



MediaFutures Research & Innovation Centre

Vision

MediaFutures' main goal is to generate innovation and value creation for the Norwegian news media and media technology industry through long-term research on responsible media technologies.

We are the first research center in Norway to develop advanced new media technology for responsible and effective media user engagement, media content production, media content interaction and accessibility. We also conduct research on novel methods and metrics for precise audience understanding. The centre delivers a variety of research outputs, e.g., in the form of patents, prototypes, papers and software, and performs significant research training in media technology and innovation, to ensure that the outputs of the centre will sustain and impact the media landscape in the long run, including the creation of start-up companies.

The University of Bergen is the host of the centre.

Governance structure

MediaFutures is led by the Centre Director. The Centre Director is responsible for all activity at the centre and reports to the Steering Board. The Steering board is lead by industry, has industry majority and approves decisions and meets regularly. The centre director is supported by an executive group and management group to run the centre in addition to an ethics and advisory committee. The day-to-day management of the centre is carried out by the Centre Management Group. The technical work is carried out in work packages (WPs). The WPs are run by a scientific leaders and an industry co-leader. The WPs are organised in different thematic areas with allocated resources for research and innovation work. The WP leaders and the Centre Management meet regularly in the Technical Committee. The WPs are in addition supported by the WP Advisory Group who meet regularly with the WP leaders and the Centre Director to provide feedback and input on the work in-progress on the WP level.

Collaborators

MediaFutures combines the expertise of nationally and internationally renowned media-tech researchers with the expertise of both the strongest domestic media and media-tech entities (such as NRK, TV 2) as well as Norwegian media-tech multinationals with high global market penetration (such as Vizrt and Highsoft).

We have also established international collaborations through several governance bodies involving leading experts in the fields of media, information technology, ethics, etc. Our collaborators and advisors include internationally renowned experts from The European Broadcasting Union (EBU), Switzerland; The New School's Parsons School of Design, US; Northwestern University, US; Royal Holloway University of London, GB; Massachusetts Institute of Technology, US; Cornell University, US; University of Oxford, GB; The Vrije Universiteit Amsterdam, NL; The University of Klagenfurt, AT; The Open University, GB; and Stockholm University, SE.

8

years
duration

5

research and
innovation WPs

12

PhD
students

9

Postdocs

~100

people involved (scientists,
technical staff, executive level,
and supporting staff)

263.5

million NOK total budget

96

million NOK funding
from Research
Council of Norway

98.5

million NOK industry
funding

69

million NOK research
partners' in-kind
contribution

Basic Facts

Funding



International collaborators

The objective of the SFI scheme is to
Facilitate active, long-term cooperation between innovation-oriented, R&D-performing companies and prominent research groups.

Promote the development of outstanding industry-oriented research clusters that are an integral part of dynamic international networks and that enhance the internationalisation of the Norwegian business sector.

Encourage and enhance researcher training and the transfer of knowledge and technology in areas with major potential for future value creation.

Partners

4

research
partners

UiB
UiO
UiS
NORCE

12

industry partners

Schibsted
NRK
TV 2
BT
Amedia
Vizrt

Highsoft
Vimond
Fonn Group
IBM
The National Library of Norway
Wolftech

About the Norwegian Scheme for Research-based Innovation (SFI):

The SFI scheme is a national scheme under the auspices of the Research Council. The Research Council provides the basic funding for the centres that are given SFI status under the scheme for a period of up to 8 years.

Activities & Results



Understanding Media Experiences

Primary objective

The primary objective of the work package *Understanding Media Experiences* is to provide fundamental knowledge on how users will interact with the media of the future by monitoring and understanding user across content and media through advanced qualitative and quantitative approaches.

Research focus and results

Young people's media experiences

In 2022, Postdoctoral Fellow John Magnus Dahl continued with ethnographic fieldwork among young people in Norway. Dahl's main research objective is to understand how media and technology are embedded in teenagers' lives and use this understanding to develop innovative insights about what legacy media can do for younger people. To date, Dahl's study findings demonstrate that the mobile phone is essential to young people's social life. Phones not only aid young adults in maintaining relationship with their peers and families, but also enable them to establish new relations. The latter proves to be of great significance especially for young people who feel lonely or in some way 'different' from their schoolmates. Additionally, the phone screen is also 'social'. When meeting physically, young people alternately look at each other's phone screens to show one another things they find interesting or funny.

The fieldwork has also revealed that there are various visual culture approaches to selfies on different platforms and applications. Instagram, for instance, is a front-stage – here teenagers spend significant amount of time and energy creating a certain impression. Other applications, like the photo and video editor and sharing platform VSCO, are more backstage, and are used by young adults to post things that are less perfect. Sharing without pretence seems to be related to the fact that the VSCO app doesn't publicly display metrics such as comments, likes, or followers count.

It is of little interest for young people where certain content and TV shows come from. The young audience watch things for themselves and display no relation to Norwegian platforms/producers such as NRK and TV 2. This, however, is not equivalent with them not watching content provided by the above actors. Dahl's research show that young people find Netflix's and YouTube's offer more suitable and relevant. FIFA World Cup was the only event that brought together young people and their families in front of the TV screens.

Digital news use

Our scientific activities revolved also around matters on how to understand digital news use. PhD candidate Marianne Borchgrevink-Brækhus conducted a study together with WP1 co-leader Hallvard Moe on how young people who do not pay for news experience digital news subscriptions. Their research points to three key dimensions to why these young people were reluctant to pay for online news: lack of exclusivity, subscriptions as too time-consuming, and unattractive payment models. Drawing on rich empirical data from two interview rounds and a subsidized subscription period combined with media diaries, the study demonstrates that the absence of payment practices does not necessarily translates into lower interest in news, or even lacking access to subscription-based content. Instead, many relied on a myriad of strategies to get access to subscription-based content without paying. Furthermore, the study illustrates that the informants' preference for "multi-perspectivism" (reflecting practices where they pick and choose across different providers), simultaneously poses a challenge for the current subscription models, as these young news users to a lesser extent seem to identify with the individual providers,

Technological innovations and audience behaviour

In his research, Erik Knudsen explores patterns and effects of news and political communication, trust in journalism, and exposure to like-minded information, and polarization and fragmentation.

In 2022, Knudsen published the article Modeling News Recommender Systems' Conditional Effects on Selective Exposure: Evidence from Two Online Experiments in the Journal of Communication, which is widely regarded as the most prestigious journal in the field. In the article, Knudsen proposes and empirically tests a new framework for studying and theoretically understanding the conditions under which news recommender systems are likely to influence people's tendency to seek news that supports their political views.

The researcher also contributed as one of the main authors to the article How Rally-Round-the-Flag Effects Shape Trust in the News Media: Evidence from Panel Waves Before and During the COVID-19 Pandemic Crisis, which is forthcoming in the journal Political Communication, the flagship journal within the subfield of political communication. The article theorizes how and why large international crises are likely to influence people's trust in the news media. The study follows the same individuals'

trust in the news media over time through an online panel survey, from before the COVID-19 crisis to two years after the initial outbreak and lockdown in Norway.

Additionally, last year Knudsen presented the annual Media Survey at the Nordic Media Days, and talked about his research at the ICA (the largest and most prestigious international communication science conference). He also hosted a virtual workshop on data collection through the infrastructure DIGSSCORE. The workshop resulted in a research collaboration between industry partners and researchers in Work Package 1 on audience's use of constructive news. The study was conducted in December 2022 and is currently in the data analysis phase.



Brita Ytre-Arne
Professor, WP Leader,
University of Bergen



Hallvard Moe
Professor, WP Co-Leader,
University of Bergen



Kristian Tolonen
Industry WP Co-Leader,
NRK



User Modeling, Personalisation & Engagement

Primary objective

The primary objective of this work package is the development of responsible user modeling and personalization techniques based on state-of-the-art AI algorithms capable of learning the personal preferences of users and providing them with recommendations. Such techniques will support users when making choices on what to consume on media platforms and assist them in discovering fresh and diverse media content (e.g. news articles, and movie items).

Research focus and results

While becoming a critical part of our digital lives and a valuable tool for many businesses, the use of recommendation and personalization systems may also lead to certain undesired effects. The best-known example can be the popularity bias, i.e., the over-concentration of recommendations on the media content that is generally popular. This can in turn intensify the dominance of mainstream content in media platforms and thereby making it more difficult for users to discover niche or diverse content online.

Our work package aims to tackle such undesired phenomena by taking into account key factors for responsible personalization and recommendation including individual and societal values, in addition to business values. The result of responsible personalization and recommendation will be significant in enhancing the user experience when interacting with media content provided by media platforms.

Popularity bias

In novel research, PhD candidate Anastasiia Klimashevskaya, has conducted an extensive survey on the causes and effects of popularity bias in recommendations and explored the phenomenon from ethical and technical perspectives. The survey described the progress in the relevant fields of studies and highlighted the research gaps in this research. In collaboration with TV 2, Anastasiia has developed and evaluated techniques for mitigation of popularity bias at the platform level. Her in-depth analyses conducted in the form of offline and online experiments revealed several interesting outcomes and showed the effectiveness of the techniques in terms of various beyond-accuracy metrics. In addition to that, several master theses projects have been focused on enhanced personalization and recommendation in collaboration with industry partners, including TV 2, Amedia, Schibsted, and BT. The outcomes of these projects have been delivered as scientific publications and

master theses. Live demos and prototypes have been presented and codes have been shared via GitHub repositories.

A notable example is a novel personalization technique developed by David Kvasnes Olsen in his thesis, co-supervised by WP2 industry partner (TV 2). In his master thesis, he investigated whether the use of visual analysis of movies can aid in finding visual similarities among movies that can be utilized further to generate personalized recommendations for users. In particular, David built a prototype of a tool that can automatically analyze media content (e.g., posters, trailers, or even full-length movies) and extracted a set of stylistic visual features, e.g., colorfulness and brightness level. The project yielded promising results and the technique has been further deployed and tested on the TV 2 platform. The student has integrated his tool into the production pipelines at TV 2, facilitating prototype testing of the technique and exposing the results to end-users of TV 2 Play.

Fairness

In our research we have also been focusing on fairness in advertisements by improving the contextualization of the ads content. A master thesis project has been developed by Daniel Christopher Jakobsen, co-supervised by industry partner Amedia. In his thesis, Daniel has investigated the potential of using visual analysis to obtain a better representation of the ads content and to responsibly improve the relevance of advertisements to the interest of the users. The outcomes of the analyses contributed to making a more contextualized advertisement in media platforms which can be beneficial for both users and businesses as important stakeholders in this domain. The thesis addressed the challenge of contextualization in the advertisement by proposing a method that can help news-sharing platforms and industries to improve their advertisement process. This can hence contribute to a more healthy and fair environment and improve the satisfaction of different stakeholders in the media domain.

The outcomes of the research in our team have been several publications in top journals including Springer User Modeling and User-Adapted Interaction and Frontiers Journal in Artificial Intelligence. Further publications have been published in conferences and workshops, including ACM UMAP 2022 conference and BIAS 2022 workshop as part of ECIR 2022.



Mehdi Elahi
Assoc. Professor,
WP Leader,
University of Bergen



Christoph Trattner
Professor, Centre Director,
WP Co-Leader,
University of Bergen



Lars Skjærven
Industry WP Co-Leader,
TV 2

Media Content Production & Analysis



Primary objective

The goal of this work package is to support journalists with tools for news content analysis and production. Journalists need to deal with tremendous amounts of data from diverse sources, their own and other news outlets, social media content, public data bases, and information on the web. It has become vital for the journalists to efficiently process the content from all these sources. The goal of our research group is to support newsrooms with tools for news content analysis and production.

Research focus and results

Debunking false information

In recent years, we have observed a tremendous amount of content on social media covering events related to the Covid-19 pandemic and the Ukrainian war. Social media is not only used for good, and the fight against misinformation and fake news has become very demanding. Journalists need to verify the accuracy of the contents published, particularly in the streams of information coming from social media. The academic and media industry partners of this work package have contributed to developing cutting-edge solutions for detecting misinformation, fake news, and deep fake images and videos. Our researchers closely collaborate with fact-checking organizations and identify new innovative ways to verify news content.

During the year, we have gained an overview of research on visual content verification in journalism and organized a repository of resources for this purpose. In late in the year, our PhD student, Sohail Khan, visited Faktisk.no for 2.5 months. During his visit, he worked on multimedia content verification and developed two different prototypes for journalists and fact-checkers. The first prototype was a deep learning-based military vehicle classification web tool, which can predict the make and model of a military vehicle (such as main battle tanks and artillery vehicles) present in an image. The second prototype was a language detection, transcription, and translation web service based on OpenAI's Whisper model. This service is helpful for journalists and fact-checkers in identifying the language being spoken in an audio or video file, and further helps in verifying the content.

Several approaches have been explored to support fact checking, such as using deep learning on datasets with Norwegian text. However, it has become evident that fact checking is a collaborative process between journalists and AI methods to verify content. Interviews with journalists suggest that they need to be aware of claims that need checking, rather than the verification process itself. Along these lines, the idea of a fact-check chatbot has been proposed to identify content that has been verified or debunked. Moreover, practitioners require explanations for the outcome of automated fact checks. In late 2022, our postdoc Ghazal Sheikhi visited the University of Stuttgart to work on fact-checking claims related to COVID-19 in social media posts. The idea was to use health and medicine ontologies to detect and correct claims.

Fact-checking serves a purpose for journalists in the continuous hunt for newsworthy events on social media. In this work package, we are investigating techniques for continuously monitoring content on social media, analyzing engagement and sentiments in posts, and tracing their popularity using artificial intelligence techniques. Academic researchers in this work package have presented a conceptual framework for social media content analysis

Automated content production

In 2022, our team has been collaborating with the Norwegian live sport service VG Live to develop a semi-automated pipeline that streamlines and simplifies the process of finding relevant social media content. Covering a sporting event requires journalists to engage in many parallel time- and effort-consuming activities, such as following the event, creating articles about it, and providing the audience with pictures, comments, as well as social media content. The idea is to serve the journalist with possible tweets that can be posted as part of the reporting. A proof-of-concept tool has been developed in collaboration with Schibsted.

In this work package, we utilize various artificial intelligence techniques, such as machine learning, network analysis, natural language processing, and deep learning. However, it is crucial for us to ensure that the core principles of ethical journalism are not compromised. While automated journalism, also known as algorithmic

journalism or robot journalism, is a promising approach for news content production, there are many challenges associated with its practical implementation in newsrooms. As part of this, our academic researchers have identified properties of data and algorithms that may create fairness issues in automated journalism.

Professor Andreas L. Opdahl led the important work of producing a high-quality journal paper that gives an overview of how knowledge graphs can be used in news analysis and production. Additionally, we are in the final stages of producing a vision paper that extensively covers the research challenges in the large area of trustworthy news verification and automation. Building on this work, our researchers and industry partners will continue to investigate novel ways for content verification and automated journalism that are trustworthy and responsible.



Bjørnar Tessem
Professor, WP Leader,
University of Bergen



Fazle Rabbi
Assoc. Professor,
WP Co-Leader,
University of Bergen



Are Tverberg
Industry
WP Co-Leader,
TV 2



Media Content Interaction & Accessibility

Photo By cottonbro studio on pexels.com

Primary objective

Work package *Media Content Interaction & Accessibility* researches methods and technologies for interaction between media content and users, both human and computerized, to provide personalized, adapted media experiences to all users regardless of their technical aptitude and personal needs.

Research focus and results

Industry-oriented research

Dr. Njaal Borch, NORCE, who is also the leader of WP4, has established and managed an impressive list of industrial collaborations in 2022. With NRK & NORCE, Njaal developed a demonstration of textual PodCasts, presented at the EBU conference. With NORCE, he created several pipelines for the automated processing and creation of textual and visual value-adding datasets, providing increased quality of services due to the availability of better AI models. With the Schibsted Bergens Tidende (BT), a contact was established targeting textual PodCasting. Also with NORCE, a full demonstration of combined AI generated datasets with fancy subtitles, dynamic aspect ratio, and automated lookups for one episode of Debatten was developed. With the Schibsted Verdens Gang (VG), requirements in both automatic transcribe with speaker identification for content production and dynamic aspect ratio were established. Moreover, the introduction of new and/or improved methods/models/technology to enhance value creation, when applicable, were achieved. With Schibsted, we have started working on practical use of the Whisper speech to text model for video subtitling and podcast transcription. With TV2 Skole, we have integrated multiple assets based on AI generated datasets from our site. Finally, there are compelling innovation results. With TV2, the work of PhD candidate Peter Andrews, demonstrated at the annual meeting on 15th November, clearly shows validated strategies, techniques, and approaches for TV2 in the gathering, processing, and use of live sports imagery.

Research by Early-Stage Researchers

Peter Andrews (PhD-candidate) focuses on investigating, understanding, and demonstrating how the analysis of sports video content can present viewers with valuable insights into the game, such as player performance and team strategies.

While this would benefit coaches and players, it can also be useful for end-viewers who wish to analyze their team's performance or track their favorite players. Football is a game that can heavily benefit from automated video content analysis. Player and ball localisation can give insights into the strategic elements of team distributions and help monitor player performance. Localisation of players allows for the visualization of their trajectories and event detection, which could enhance the accessibility of sports games and facilitate video summarization. Recent advances in Computer Vision, Deep Learning, and Graphical Processing Units have had a profound impact on sports video content analysis. However, applying these models provides a unique set of challenges. The industrial user-stakeholder of Peter's project is TV2 2.

Ingar Mæhlum Arntzen (PhD-candidate) researches how client-side approaches can bring great opportunities for personalization and accessibility in timed media experiences. However, addressing personalisation at the clients-side implies new challenges for UX developers. In particular, current methods and tools for UX development have little support for time-driven rendering (e.g., playback) which are required by media related scenarios. In addition, interactivity is a key driver for UX-based experiences, yet there is no simple way to record and distribute interactivity, except to record the effects of interactivity as video. Instead, certain use cases in media call for ways to record, distribute and playback interactivity directly within a UX-based rendering framework. Still, UX development is already quite complicated in the first place, so adding support for timed rendering and replayable interactivity may make things even worse. The challenge then, is to develop methods and concepts which makes development of time-sensitive, UX-based media experiences easy enough to become practical. Potential industrial user-stakeholder of Ingar's project are TV2 Skole, NRK and Vizrt.

Jonathan Geffen (PhD-candidate) has partly focused on novel interactive designs for gamified sports viewing. This work was conducted in collaboration with Peter Andrews and builds on his work. A prototype of a social football gamification mini-game was developed in Unity. This prototype receives real-time game analytics data from the video content

analysis framework Peter developed. The industrial user-stakeholder of Jonathan's project is TV2 Skole who have expressed interest in using this prototype for their future research endeavors on sport viewing gamification for children.

International networking

In 2022, Professor Morten Fjeld, the co-leader of the work package, joined the European Cooperation in Science and Technology (COST) research network on Media Accessibility. The action aims to help all stakeholders in the field of Media Accessibility and cross-cutting topics, e.g., AI and interactive technologies, in Europe to meet the legal milestones requested by the recently passed European legislation.



Njål Borch

Senior Researcher, WP Leader,
NORCE Norwegian
Research Centre



Morten Fjeld

Professor, WP Co-Leader,
University of Bergen



Petter Ole Jakobsen

Industry WP Co-Leader,
Vizrt

Norwegian Language Technologies

Primary objective

Language technologies are at the core of media technologies. Our research group aims to provide datasets and models for Norwegian (Bokmål/Nynorsk) that support the automated understanding as well as the automated production of media texts in this language.

Research focus and results

Data collection

The collaborative collection and subsequent release of a text corpus dubbed the Norwegian Media Corpus continues to be an important long-term goal of our work package. The year of 2022 has seen several important results in this area:

- development of in-house pipelines for text extraction
- work on data licensing
- development of a common framework for metadata
- sharing of textual news data by all involved partners to the MediaFutures cloud amounting to approximately 6.5M news articles

Data annotation

Manually annotated data is central in the development of neural NLP models. There are currently ongoing efforts to create the first Norwegian dataset of news annotated for events. The annotation follows adapts the annotation guidelines for the English ACE-dataset to Norwegian news. Manual annotation is on-going, where student research assistants are labeling news data for training of event extraction systems. The resulting dataset will be released in 2023 and will be used for training of the EventGraph system described below.

Modelling

Current modelling efforts in our research group revolve around the creation of a system for event extraction from news text. In natural language processing *event extraction* aims at detecting event instance(s) in texts and identifying the event type together with its participants and attributes, if existing. The obtained structured representations of events can further be used in diverse tasks, such as to expand existing knowledge base, to monitor social events, and so on.

In 2022, our team has published two scientific articles on the topic of event extractions: *EventGraph: Event Extraction as Semantic Graph Parsing* and *EventGraph at CASE 2021 Task 1: A General Graph-based Approach to Protest Event Extraction*. In these articles, researchers Huiling You, David Samuel, Samia

Touileb and Lilja Øvrelid present EventGraph, a joint framework for event extraction, which encodes events as graphs, and discuss its application to the *Multilingual Protest Event Detection* - shared task set up during the 2021 and 2022 Workshop on Challenges and Applications of Automated Extraction of Socio-political Events from Text (CASE).

2022 has also seen the completion of two master theses supervised by members of this work package. Yauhen Khutarniuk, master's student at the University of Oslo, investigated *Cross-Lingual Approaches to Identifying Argument Components and Relations in Norwegian Reviews*. Master's student Katarina Ekren from the University of Bergen in turn, in a thesis entitled *Experiments on Satire Detection for Norwegian News Articles* presented the first attempt to automatically detecting satire in Norwegian news articles.

Analysis

Large-scale language models have received considerable attention in the past year with wide-spread use and uptake also in the media landscape. We are deeply involved in the analysis and the ethical implications of these models. Several publications on this topic, which are listed at end of this Annual Report, have been presented in international venues. In these publications our researchers investigate how correlations between occupations and gendered-pronouns can be affected and changed by adding negation in bias probes, or changing the grammatical tense of the verbs in the probes. We also explore how a demographic distribution of occupations, along gender dimensions, is reflected in pre-trained language models. Finally, study co-authored by Samia Touileb demonstrates that some of the popular Norwegian, Danish, and Swedish language models generate harmful and gender-biased stereotypes. The finding goes against the general expectations related to gender equality in Scandinavian countries.



Lilja Øvrelid
Professor, WP Leader,
University of Oslo



Koenraad de Smedt
Professor, WP Co-Leader,
University of Bergen



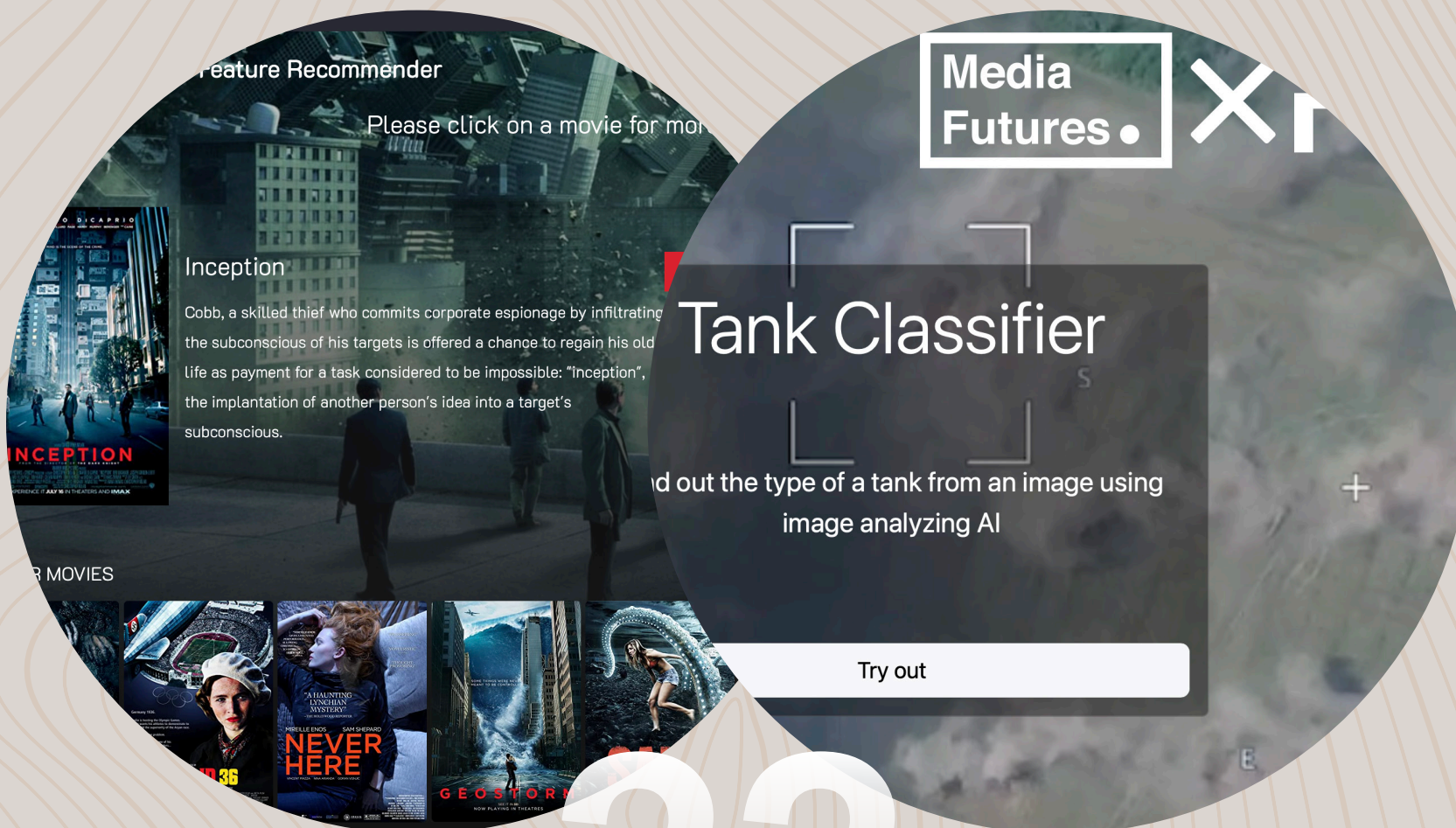
Emiliano Guevara
Industry WP Co-Leader,
Amedia

Prototypes & Demos

Innovation in 2022 at MediaFutures took place mainly through making research results accessible in the form of demos and prototypes, as well as through taking further steps towards developing a common understanding of innovation in an academic-industry context. In respect of the latter, we have collaborated with Vestlandets Innovasjonsselskap (TTO), the Innovation Department at the University of Bergen, the cluster coordinator NCE Media, in addition to arranging a larger workshop with external facilitator, Sofie Hvitved from the Copenhagen Institute of Future Studies.

This year has helped us to discover that code sharing, demos and prototypes constitute an effective way to challenge our researchers, and to engage with partners on discussions regarding research and its application. A perfect venue to showcase the demos and prototypes was our yearly conference.

The centre has created a shared programming and code repository on GitHub, as well as a digital infrastructure using NREC and ownCloud technology for storing and sharing data.



Here are selected highlights from the innovation work at MediaFutures in 2022:

Debatten

MediaFutures edition of Debatten, 1. November 2022. Includes dynamic aspect ratio (MediaPipes AI), Fancy Subs (Automated, Whisper++).

Media Forensics

Fact-checking visual user-generated content is crucial to be able to navigate in the streams of information provided online. Media Forensics Repository presents a diverse set of resources to assist journalists, fact-checkers, and the public in verifying such content.

News Usage

News Use Aggregation Tool allows to look deeper into users' media diet and visually represents how users consume media, focusing on user history over a month and providing infographics that can be used for further research.

Re-Ranker

Recommender systems are used in practice on most streaming platforms. However, the recommendations provided to users can be affected by popularity bias, meaning that the most popular items are recommended time and time again, while more niche movies or series rarely make an appearance. Re-Ranker attempts at tackling this problem, while also taking into account user's watching history, since some users prefer popular items and, thus, should get more popular recommendations, while niche users want to discover something less mainstream.

Tank Classifier

The AI image classifier, developed in collaboration with Faktisk.no, recognizes tanks and artillery vehicles and makes it easier for journalists and fact-checkers to verify online content.

Language Checker

A language detection, transcription and translation web service based on OpenAI's Whisper model, developed in collaboration with Faktisk.no

Ballspark

MediaFutures edition of Ballspark. Soccer discussion (in Norwegian), quite heavy Bergen dialect. Fully automatic using Whisper (large) and nvidia/speakerverification titanet (large) for transcribing and speaker identification. Info links are based on a Norwegian trained network for annotation combined with simple Wikipedia searches.

News in English

MediaFutures edition of News in English. Created for Norwegian school pupils. Added some relevant articles manually, otherwise automated. Texts created fully automatic using Whisper (large) and nvidia/speakerverification titanet (large) for transcribing and speaker identification. Info links are based on a Norwegian trained network for annotation combined with simple Wikipedia searches.

Gender guesser

A demo illustrating the problem of gender bias in Scandinavian pre-trained language models. "Gender guesser" was developed to demonstrate the findings of the research paper "Occupational Biases in Norwegian and Multilingual Language Models".

Visit www.mediafutures.no/publications/demos/ to learn more about all demos developed by our team.

Recruitments in 2022

Khadiga Seddik, PhD candidate

PhD project title: The Influence of News Recommender Technology on Selective Exposure and Sharing.

Project description: In recent years, many news agencies use algorithmic news recommender systems to filter the massive volumes of articles and guide users to explore content they would not be aware of and match them with the most relevant and personalized content. Despite the benefits the news recommenders provide, overly personalized news recommendations and too much exposure to like-minded news can pose a threat to democracy by leading to filter bubbles, echo chambers, and political polarization. In this research project, we investigate the heavily debated consequences of news recommender technologies, selective exposure, and selective sharing of like-minded news. We aim to shift the scholarly attention from uncovering whether the current recommenders amplify or reduce selective exposure and sharing to understanding the conditions under which recommender systems do so, given that they are designed for that purpose. By doing so, we shift the responsibility for the democratic implications of recommenders from the technology itself to the decisions surrounding the implementation and design.

We aim to study different factors and conditions that may influence users' selection and sharing behavior. Then we will design and develop a news recommender system and incorporate the most relevant factors into the system as design features. The system will be specifically designed to promote factors that increase or decrease selective exposure and sharing. We aim to incorporate knowledge and factors produced by WP1 and WP2 of the NEWSREC project in our prototype and study the influence of promoting such factors on user exposure and sharing behaviors. In addition, we will conduct a small-scale lab experiment and a large-scale randomized field experiment to test and validate the developed recommender system to gain an understanding of how recommenders shape selective exposure and sharing.



Jeng Jia-Hua, PhD candidate

PhD project title: Bridging the Gap of Polarized Perspectives: Changing the Thoughts of the Hard Believers in Online Communities.

Project description: Recommender systems aid in decision-making in many areas. However, undesired effects can emerge. Among these are filter bubbles: an undesirable side-effect of personalization that may lead to polarized opinions due to selective information exposure. Filter bubbles may strengthen the existing attitudes of "hard believers", who suffer from a belief perseverance: discounting contrary evidence due to their opposing attitudinal strength. A crucial issue in recommender system research is how to mitigate these undesired effects by designing recommender interfaces and machine learning models that enable people to consider to be more open to different perspectives. Alongside accurate models, the user experience is an equally important measure. Indeed, the core statistics are based on users' behaviours and experiences in this research project. Therefore, this research aims to steer the choices of hard believers based on altering their attitudes. The core methods plan to concentrate on the interface design and ML model building involving manipulations of cues, users' behaviours prediction and changing the nudges. In sum, the project aims to provide insight in the extent to which recommender systems can be effective in mitigating polarized opinions.



Ola Roth Johnsen is administrative coordinator at MediaFutures. He holds a Master's degree in economics from the University of Bergen. Previously, Ola worked at the Christian Michelsen Institute, The Norwegian Directorate of Fisheries, the Department of Information Science and Media Studies and at The Faculty of Law as a research advisor. He has extensive experience in project acquisitions from various funding sources, such as from The Norwegian Research Council and EU. He was a key administrative member in the department's involvement in establishing Media City Bergen and has through his work established good relations with the user partners in the SFI.

The centre also hired 9 research assistants to support the centre's six work packages. Their names are listed at the end of this Annual Report.

25

International Cooperation

International cooperation in 2022 at MediaFutures took many forms. In addition to facilitating monthly seminars with international guest experts and researchers, the centre has experienced an increase in researchers' mobility.

We welcomed several visiting researchers and master students. Some of the visits were financed through ERASMUS+ and ARQUS alliance's grant schemes. The University of Stuttgart in Germany in turn hosted MediaFutures' PostDoctoral Fellow Ghazaal Sheikhi. During her two months research stay at the Institute of Natural Language Processing, Sheikhi was working on project related to factual error correction for biomedical information.

Our centre has also continued engaging internationally renowned researchers in adjunct professor positions. Our adjunct professors, Profs. Enrico Motta, Irene Costera-Meijer, Oskar Juhlin, Dietmar Jannach, Nick Diakopoulos and Alain Starke have served as advisors for the work packages, and several of them also have had roles as co-supervisors for the PhD candidates and MA students at the centre.

Additionally, this year MediaFutures' researchers have joined two EU COST Actions. Founded in 1971, the European

Cooperation in Science and Technology (COST) is a funding organization for the creation of research networks, called COST Actions. Actions help connect research initiatives across Europe and beyond and enable researchers and innovators to bring to life their ideas in any science and technology field. This year, MediaFutures researcher Samia Touileb has been a secondary proposer to OPINION COST Action and has been on the management committee of the research network in question. Morten Fjeld in turn has joined COST Action - The Leading Platform for European Citizens, Industries, Academia, and Policymakers in Media Accessibility (LEAD-ME).

The centre was also a participant in an application to NOS-HS for responsible media recommendation technology, together with partners from universities in Sweden and Denmark, and with MediaFutures's director Christoph Trattner as the PI.

Additionally, MediaFutures hosted an MSCA-IF fellow, Ana Milojevic. In the project Datafication, Media and Democracy: Transformation of News Work in Datafied Society, Milojevic was conducting research on privacy, data tracking, media, and the development of journalism education. The project was completed in the autumn of 2022.



26

Communication and Dissemination Activities

In 2022, MediaFutures continued to execute the main objectives defined in its Communication Plan for 2020-2028. Throughout the year, the centre engaged with the public, national authorities, media, and other stakeholders.

MediaFutures' core website has been instrumental in the dissemination of information regarding the centre's activities and results. The website has been redesigned and expanded through creation of new pages such as Demos, Code, Admin Corner, Master Theses and Videos. Updates on our deliverables and their promotion were also done through social media accounts, newsletters, and press releases.

The Centre has worked on increasing its visibility in national and international media outlets. In the past year, our scientific staff provided expertise and was featured in TV 2 Norway, Dag og Tid, Medier24, GlobalBar, Forskning.no and in the English version of the website - Sciencenorway.no. Additionally, the centre's director Prof. Christoph Trattner was interviewed by the Bergen Chamber of Commerce and Industry where he elaborated on the importance of developing responsible media technology.

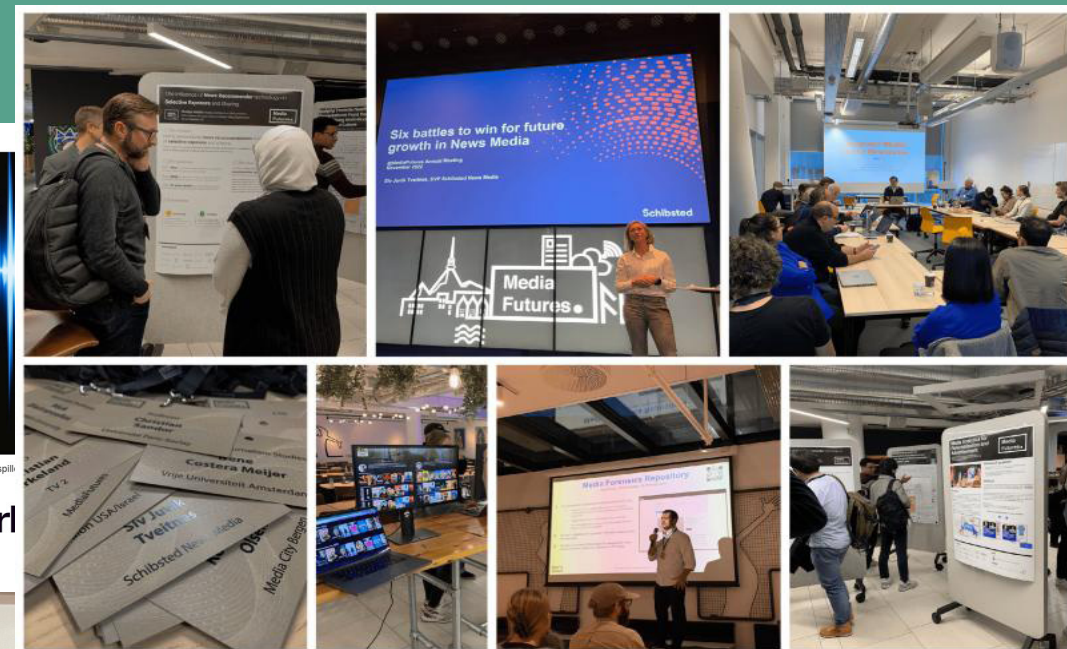
Russia's large-scale invasion of Ukraine in February 2022, and the systematic disinformation set in motion by the Russian government over the last year, renewed the attention to the potential that automated fact-checking technologies have in combating false information online. In the past year, our researchers contribute expertise in the field by developing tools that assist in debunking false information and presenting them at different forums such as 20 minutes of disinformation

series, the FutureWeek, both organized by Media City Bergen, and finally to the Ukrainian and Russian journalists who participated in the 2022 Nobel Peace Prize Ceremony in Oslo.

In parallel, the centre's scientific and innovation results have been disseminated at many high-profile conferences in Europe and beyond, such as the 34th Norwegian ICT Conference for Research and Education, the 2022 Conference on Empirical Methods in Natural Language Processing, the 72nd Annual ICA Conference and the Annual ACM RecSys Conference.

We have also held presentations for the Research Council of Norway, the Vice-Rector for Innovation, Projects, Knowledge Cluster at the University of Bergen, Nordic Media Managers, tech leaders at the Norwegian Broadcasting Corporation, Vestlandsbenken, the Norwegian Committee on Family and Cultural Affairs, the Finish Broadcasting Company, among others. Additionally, the centre facilitated interactions and knowledge sharing with the partners in the Centre, and arranged trips, among others, to Oslo and Vik in Sogn to meet with NRK, Amedia, UiO, the National Library of Norway, Schibsted and Highsoft.

Finally, on November 15-16 the Centre brought together over 130 guests, for the MediaFutures Annual Meeting. Gathered researchers, students and industry partners were provided with an opportunity to receive first-hand updates and insight into the centre's work, and the chance to network and engage in discussion on subjects related to MediaFutures' research areas.



★ / Aktuelt / Å utvikle ansvarlig medieteknologi er avgjørende for demokratiet

Å utvikle ansvarlig medieteknologi er avgjørende for demokratiet

Medier spiller en avgjørende rolle i et liberalt, demokratisk samfunn. I de siste tiårene har medieindustrien stått i store og krevende omstillinger. Digitalisering, konkurranse fra internasjonale teknologiske selskaper og fremveksten av kunstig intelligens har gitt medieselskaper rom til å vokse, samtidig har dette skapt nye utfordringer.



OPINION Alain Starke

Many have come out to say that ChatGPT will replace various jobs: programmers, journalists, creative writers, to name a few. I think we will be fine, Alain Starke, writes. (Photo: Shutterstock / NTB)

No, the new AI chatbot ChatGPT won't take your job

Peer-reviewed papers:

Aneja, S., Midoglu, C., Dang-Nguyen, D. T., Khan, S. A., Riegler, M., Halvorsen, P., ... & Adsumilli, B. (2022). ACM Multimedia Grand Challenge on Detecting Cheapfakes. arXiv preprint arXiv:2207.14534.

Bogina, V., Kuflik, T., Jannach, D., Bielikova, M., Kompan, M., & Trattner, C. (2022). Considering temporal aspects in recommender systems: a survey. User Modeling and User-Adapted Interaction, 1-39.

Borchgrevink-Brækhus, M. (2022). «Det er ikke plass til alt på internett»: algoritmestyrte forsider og redaksjonelle vurderinger. Norsk Medietidsskrift, 29(3), 1-17.

Castiglia, G., El Majjodi, A., Calò, F., Deldjoo, Y., Narducci, F., Starke, A. D., & Trattner, C. (2022). Nudging Towards Health in a Conversational Food Recommender System Using Multi-Modal Interactions and Nutrition Labels.

El Majjodi, A., Starke, A. D., & Trattner, C. (2022). Nudging towards health? examining the merits of nutrition labels and personalization in a recipe recommender system. In Proceedings of the 30th ACM Conference on User Modeling, Adaptation and Personalization (pp. 48-56).

Elahi, M., Starke, A., El Ioini, N., Lambrix, A. A., & Trattner, C. (2022). Developing and Evaluating a University Recommender System. Frontiers in Artificial Intelligence, 4, 212.

Elsweiler, D., Hauptmann, H., & Trattner, C. (2022). Food Recommender Food recommenderSystems. In F. Ricci, L. Rokach, & B. Shapira (Eds.), Recommender Systems Handbook (pp. 871–925). doi:10.1007/978-1-0716-2197-4_23.

Fatemi, Bahareh & Rabbi, Fazle & Tessem, Bjørnar. (2022). Fairness in automated data journalism systems. 10.13140/RG.2.2.30374.19522.

Gallofré Ocaña, M., & Opdahl, A. L. (2022). Supporting Newsrooms with Journalistic Knowledge Graph Platforms: Current State and Future Directions. Technologies, 10(3), 68.

Hacid, H., Aldwairi, M., Bouadjenek, M. R., Petrocchi, M., Faci, N., Outay, F., ... & Dong, H. (Eds.). (2022). Service-Oriented Computing–ICSOC 2021 Workshops: AIOps, STRAPS, AI-PA and Satellite Events, Dubai, United Arab Emirates, November 22–25, 2021, Proceedings (Vol. 13236). Springer Nature.

Hagen, M., Verberne, S., Macdonald, C., Seifert, C., Balog, K., Nørvåg, K., & Setty, V. (Eds.). (2022). Advances in Information Retrieval: 44th European Conference on IR Research, ECIR 2022, Stavanger, Norway, April 10–14, 2022, Proceedings, Part I (Vol. 13185). Springer Nature.

Hagen, M., Verberne, S., Macdonald, C., Seifert, C., Balog, K., Nørvåg, K., & Setty, V. (Eds.). (2022). Advances in Information Retrieval: 44th European Conference on IR Research, ECIR 2022, Stavanger, Norway, April 10–14, 2022, Proceedings, Part II (Vol. 13185). Springer Nature.

Hauptmann, H., Said, A., & Trattner, C. (2022). Research directions in recommender systems for health and well-being: A Preface to the Special Issue. User Modeling and User-Adapted Interaction, 1-6.

Khan, S. A., & Dang-Nguyen, D. T. (2022). Hybrid Transformer Network for Deepfake Detection. In Proceedings of the 19th International Conference on Content-based Multimedia Indexing (pp. 8-14).

Klimashevskaja, A., Elahi, M., Jannach, D., Trattner, C., & Skjærven, L. (2022). Mitigating Popularity Bias in Recommendation: Potential and Limits of Calibration Approaches. In Advances in Bias and Fairness in Information Retrieval: Third International Workshop, BIAS 2022, Stavanger, Norway, April 10, 2022, Revised Selected Papers (pp. 82-90). Cham: Springer International Publishing.

Knudsen, E. (2022). Modeling news recommender systems’ conditional effects on selective exposure: evidence from two online experiments. Journal of Communication.

Kvifte, T., Elahi, M., & Trattner, C. (2022). Hybrid Recommendation of Movies Based on Deep Content Features. In Service-Oriented Computing–ICSOC 2021 Workshops: AIOps, STRAPS, AI-PA and Satellite Events, Dubai, United Arab Emirates, November 22–25, 2021, Proceedings (pp. 32-45). Cham: Springer International Publishing.

Losada, D., Elsweiler, D., Harvey, M., & Trattner, C. (2022). A day at the races: Using best arm identification algorithms to reduce the cost of information retrieval user studies. Applied Intelligence, 52. doi:10.1007/s10489-021-02719-2.

Mæhlum, P., Kåsen, A., Touileb, S., & Barnes, J. (2022, October). Annotating Norwegian language varieties on Twitter for Part-of-speech. Proceedings of the Ninth Workshop on NLP for Similar Languages, Varieties and Dialects, 64–69. Retrieved from https://aclanthology.org/2022.vardial-1.7.

Naerland, T. U., & Dahl, J. M. (2022). Beyond representation: Public service media, minority audiences and the promotion of capabilities through entertainment. Poetics, 92, 101687.

Opdahl, A. L., Al-Moslmi, T., Dang-Nguyen, D. T., Gallofré Ocaña, M., Tessem, B., & Veres, C. (2022). Semantic Knowledge Graphs for the News: A Review. ACM Computing Surveys, 55(7), 1-38.

Starke, A. D., & Lee, M. (2022). Unifying recommender systems and conversational user interfaces. In Proceedings of the 4th Conference on Conversational User Interfaces (pp. 1-7).

Starke, A. D., Sedkowska, J., Chouhan, M., & Ferwerda, B. (2022). Examining Choice Overload across Single-list and Multi-list User Interfaces. In 9th Joint Workshop on Interfaces and Human Decision Making for Recommender Systems (IntRS’22).

Starke, A., El Majjodi, A., & Trattner, C. (2022). Boosting Health? Examining the Role of Nutrition Labels and Preference Elicitation Methods in Food Recommendation. In Interfaces and Human Decision Making for Recommender Systems 2022 (pp. 67-84).

Tessem, B., Nyre, L., d. S. Mesquita, M., & Mulholland, P. (2022). Deep learning to encourage citizen involvement in local journalism. In Futures of Journalism: Technology-stimulated Evolution in the Audience-News Media Relationship (pp. 211-226). Cham: Springer International Publishing.

Touileb, S. (2022). Exploring the Effects of Negation and Grammatical Tense on Bias Probes. In Proceedings of the 2nd Conference of the Asia-Pacific Chapter of the Association for Computational Linguistics and the 12th International Joint Conference on Natural Language Processing (pp. 423-429).

Touileb, S., & Nozza, D. (2022). Measuring Harmful Representations in Scandinavian Language Models. Proceedings of the Fifth Workshop on Natural Language Processing and Computational Social Science (NLP+CSS), 118–125. Retrieved from https://aclanthology.org/2022.nlpcss-1.13.

Touileb, S., Øvrelid, L., & Velldal, E. (2022). Occupational biases in Norwegian and multilingual language models. In Proceedings of the 4th Workshop on Gender Bias in Natural Language Processing (GeBNLP) (pp. 200-211).

Trattner, C., Jannach, D., Motta, E., Costera Meijer, I., Diakopoulos, N., Elahi, M., ... & Moe, H. (2022). Responsible media technology and AI: challenges and research directions. AI and Ethics, 2(4), 585-594.

van den Oever, F., Gorobets, V., Fjeld, M., & Kunz, A. (2022). Comparing Visual Search between Physical Environments and VR. In 2022 IEEE International Symposium on Mixed and Augmented Reality Adjunct (ISMAR-Adjunct) (pp. 411-416). IEEE.

Wang, Z., Hu, Z., Man, Y., & Fjeld, M. (2022). A Collaborative System of Flying and Ground Robots with Universal Physical Coupling Interface (PCI), and the Potential Interactive Applications. In CHI Conference on Human Factors in Computing Systems Extended Abstracts (pp. 1-7).

You, H., Samuel, D., Touileb, S., & Øvrelid, L. (2022). EventGraph at CASE 2021 Task 1: A General Graph-based Approach to Protest Event Extraction. Proceedings of the 5th Workshop on Challenges and Applications of Automated Extraction of Socio-Political Events from Text (CASE), 155–160. Retrieved from https://aclanthology.org/2022.case-1.22.

You, H., Samuel, D., Touileb, S., & Øvrelid, L. (2022). EventGraph: Event Extraction as Semantic Graph Parsing. Proceedings of the 5th Workshop on Challenges and Applications of Automated Extraction of Socio-Political Events from Text (CASE), 7–15. Retrieved from https://aclanthology.org/2022.case-1.2.

Zhang, Z., Setty, V., & Anand, A. (2022). SparCAssist: A Model Risk Assessment Assistant Based on Sparse Generated Counterfactuals. In Proceedings of the 45th International ACM SIGIR Conference on Research and Development in Information Retrieval (pp. 3219-3223).

Reports:

Moen, John Arne; Næss, Ingvild; Nag, Toril; Busch, Tor Aksel; Høyer, Marianne; Haugli, Trude; Aasberg, Oddhild; Grande, Trine Skei; Schartum, Dag Wiese; Veum, Helge mfl. NOU 2022: 11 Ditt personvern – vårt felles ansvar — Tid for en personvernpolitikk. 2022, 245 ss.

Centre Management

Christoph Trattner	UiB	Centre Director
Ola Roth Johnsen	UiB	Administrative Coordinator

Support Staff

Malgorzata Anna Pacholczyk	UiB	Communication Officer
Kata Urban	UiB	Research Assistant
Snorre Alvsvåg	UiB	Research Assistant
Daniel Rosnes	UiB	Research Assistant
Ella Maria Holli	UiB	Research Assistant
Svenja Lys Forstner	UiB	Research Assistant
Thale Knudsen Kirkhorn	UiB	Research Assistant
Ole Johan Holgernes	UiB	Research Assistant
Anastasia Vlasenko	UiB	Research Assistant
David Kvasnes Olsen	UiB	Research Assistant
Odin Stokkeland	UiB	Research Assistant
Stephanie Portales	UiB	Research Assistant
Didrik Krog	UiB	Research Assistant
Cody Gallo	UiB	Research Assistant

Key Researchers

Brita Ytre-Arne	UiB	Understanding Media Experiences
Hallvard Moe	UiB	Understanding Media Experiences
Erik Knudsen	UiB	Understanding Media Experiences
Kristian Tolonen	NRK	Understanding Media Experiences
Iacob Prebensen	NRK	Understanding Media Experiences
Christopher Trattner	UiB	User Modeling, Personalization & Engagement
Mehdi Elahi	UiB	User Modeling, Personalization & Engagement
Igor Pipkin	Amedia	User Modeling, Personalization & Engagement
Helle Sjøvaag	UiS	User Modeling, Personalization & Engagement
Lars Skjærven	TV 2	User Modeling, Personalization & Engagement
Thomas Husken	BT	User Modeling, Personalization & Engagement
Eivind Throndsen	Schibsted	User Modeling, Personalization & Engagement
Eva Hagan	NRK	User Modeling, Personalization & Engagement
Bjørnar Tessem	UiB	Media Content Production & Analysis
Andreas Lothe Opdahl	UiB	Media Content Production & Analysis
Duc-Tien Dang-Nguyen	UiB	Media Content Production & Analysis
Vinay Setty	UiS	Media Content Production & Analysis
Are Tverberg	TV 2	Media Content Production & Analysis
Fazle Rabbi	UiB	Media Content Production & Analysis
Eivind Fiskerud	BT	Media Content Production & Analysis
Njål Borch	NORCE	Media Content Interaction & Accessibility
Morten Fjeld	UiB	Media Content Interaction & Accessibility
Frode Guribye	UiB	Media Content Interaction & Accessibility

Helwig Hauser	UiB	Media Content Interaction & Accessibility
Ingar Mæhlum Arntzen	NORCE	Media Content Interaction & Accessibility
Petter Ole Jakobsen	VIZRT	Media Content Interaction & Accessibility
Grethe Hjetland	Highsoft	Media Content Interaction & Accessibility
Lubos Steskal	TV 2	Media Content Interaction & Accessibility
Sergej Stoppel	Wolftech	Media Content Interaction & Accessibility
Lilja Øvrelid	UiO	Norwegian Language Technologies
Koenrad de Smedt	UiB	Norwegian Language Technologies
Emiliano Guevara	Amedia	Norwegian Language Technologies
Erik Velldal	UiO	Norwegian Language Technologies
Samia Touileb	UiB	Norwegian Language Technologies

International Researchers

Irene Costera Meijer	Vrije Universiteit Amsterdam	Understanding Media Experiences
Dietmar Jannach	Universität Klagenfurt	User Modeling, Personalization & Engagement
Alain Starke	Wageningen University & Research	User Modeling, Personalization & Engagement
Enrico Motta	Open University, UK	Media Content Production & Analysis
Oskar Juhlin	Stockholms Universitet	Work Package Advisory Group
Nicholas Diakopoulos	Northwestern University	Work Package Advisor

Postdoctoral researchers with financial support from MediaFutures

John Magnus Ragnhildson Dahl	UiB	Understanding Media Experiences
Ghazaal Sheikhi	UiB	Media Content Production & Analysis

Postdoctoral researchers in MediaFutures with financial support from other sources

Ana Milojevic	UIB/MSCA-IF	Understanding Media Experiences
---------------	-------------	---------------------------------

PhD students with financial support from MediaFutures

Marianne Borchgrevink-Brækhus	UiB	Understanding Media Experiences
Sohail Ahmed Khan	UiB	Media Content Production & Analysis
Pete Andrews	UiB	Media Content Interaction & Accessibility
Jonathan Geffen	UiB	Media Content Interaction & Accessibility
Huiling You	UiO	Norwegian Language Technologies
Anastasiia Klimashevskaja	UiB	User Modeling, Personalization & Engagement

PhD students in MediaFutures with financial support from other sources

Ayoub El Majjodi	UiB	User Modeling, Personalization & Engagement
Khadiga Seddik	UiB	User Modeling, Personalization & Engagement
Jia-Hua Jeng	UiB	User Modeling, Personalization & Engagement

Advisory Committee

David Carroll	The New School’s Parsons School of Design
John Ellis	Royal Holloway University of London
Hans Hoffmann	The European Broadcasting Union
Alexander Rouxel	The European Broadcasting Union

Ethics Committee

Sinan Kayhan Aral	MIT
Deborah Estrin	Cornell Tech University
Luciano Floridi	University of Oxford

Steering Board

Christian Birkeland	TV 2 (Leader of the board)	Jan Erik Askildsen	UiB
Nabil Belbachir	NORCE	Turid Borgen	UiS
Laila Dahlen	Schibsted	Petter Ole Jakobsen	Vizrt
Frøy Gudbrandsen	Bergens Tidende	Torstein Harildstad	Fonn Group
Grethe Hjetland	Highsoft	Helge Høibraaten	Vimond
Hans-Henrik Merckoll	IBM	Pål Nedregotten	Amedia
Stephan Oepen	UiO	Heidrun Reisæter	NRK
Solbjørg Rauset	The Research Council of Norway (Observer)	Sergej Stoppel	Wolftech
Hege Stensrud Høsøien	The National Library of Norway		

Executive Group

Christoph Trattner	UiB	Arne Klein	TV 2
Jade Josefine Nordahl	NRK	Pål Ruud	Schibsted
Eivind Hjertholm Fiskerud	Bergens Tidende	Lilja Øvrelid	UiO/WP5

Master Students

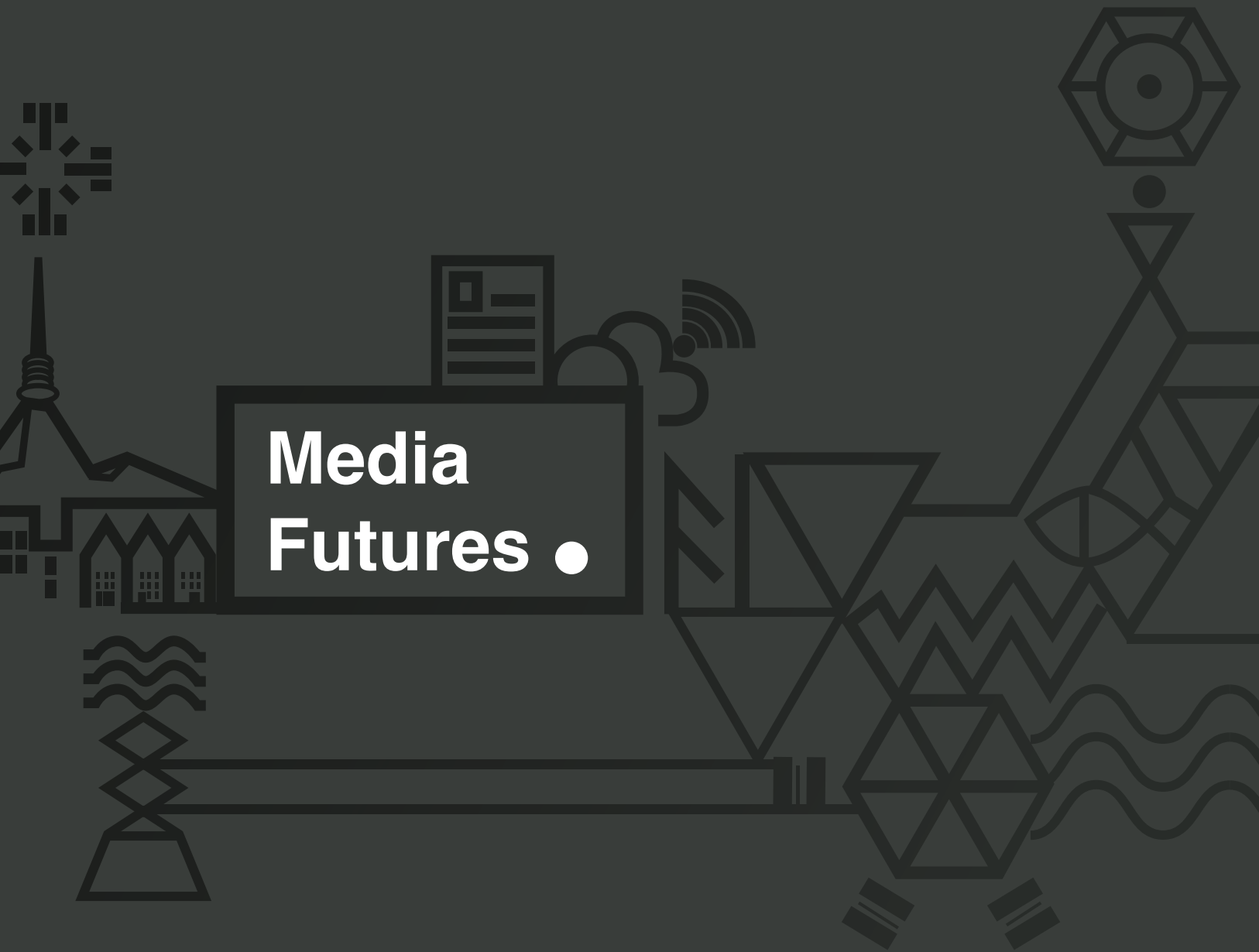
Thesis Title

Katarina Ekren	Experiments on Satire Detection for Norwegian News Articles
Yauhen Khutarniuk	Cross-Lingual Approaches to Identifying Argument Components and Relations in Norwegian Reviews
Vegard Velle Sjøen	Digital Image Forensics In The Wild: Social Media Platforms
David Kvasnes Olsen	Movie Recommendation based on Stylistic Visual Features
Torstein Hatlebakk	Automated Moderation: Detecting Irony in a Norwegian Facebook Comment Section using a Longformer Transformer Model with a Context Encoded Dataset
Benjamin Stenerud	Reaksjonsvideoer. En studie av unge voksnes opplevelser med mediefenomenet reaksjonsvideoer.
Simen Larsen Johansen	Expanding Digital Workspaces Using Cross-Device Interactive Applications
Anastasia Vlasenko	Multi-list recommendations for streaming content
Daniel Rosnes	News Recommender Systems
Anna Halvorsen Nilsen	News personalization and nudging
Vegard Rygh Solberg	Assessing Similarity in News Using Human Judgments (working title)
David René Bødtker	Nudging Stories in News Search: The Role of Visual Attractiveness and Presentation Order Effects on Online News Consumption.
Peter Røysland Aarnes	Proper Capitalization in Speech to Text Transcripts using NER
Frederik Hjelde Rosenvin	Automated Identification of Severe Errors in Speech to Text Transcripts
Espen James Rodriguez Stokke	Automated Speech to Text (ASR) Quality Metric
Daniel Christopher Jakobsen	Visual analysis, recommendation and personalization
Ingrid Åmot	Smarttelefonen som ein del av konsertopplevinga.
Frank Rune Espeseth	Media Analytics for Personalization and Advertisement
Sebastian Cornelius Bergh	Personalization and Recommendation of Upcoming Sport Events
Peter Kolbeinsen Klingenberg	News Personalization Recommender Systems
Kristine Hansen	A qualitative study of why news podcasts appeal to young adults

Accounts

Costs per project partner (in NOK 1,000)	2021	2022
UNIVERSITETET I BERGEN (Host)	12 889	22 496
UNIVERSITETET I OSLO	499	1 412
UNIVERSITETET I STAVANGER	212	273
TV 2 AS	759	924
NORSK RIKSKRINGKASTING AS	80	504
NASJONALBIBLIOTEKET	212	2 576
SCHIBSTED ASA	988	3 285
INTERNATIONAL BUSINESS MACHINES AS	59	68
VIZRT NORWAY AS	220	
WOLFTECH BROADCAST SOLUTIONS AS	72	448
BERGENS TIDENDE AS	188	378
VIMOND MEDIA SOLUTIONS AS	28	
HIGHSOFT AS	10	127
AMEDIA AS	513	491
NORCE NORWEGIAN RESEARCH CENTRE AS	1 194	1 167
FONN GROUP AS	57	
SUM	17 980	34 149

Funding sources (in NOK 1,000)	2021	2022
Own contribution (Host)	6 623	10 381
Public funding	481	2 866
Private funding	4 255	7 282
The Research Council of Norway	6 622	13 620
SUM	17 981	34 149



More information at
mediafutures.no

**Research Centre for Responsible
Media Technology & Innovation**

**Annual Report
2022**

RCN project number 309339