PROJECT NEWSLETTER NO. 3

May 2022

Interreg North Sea Region AVATAR
European Regional Development Fund
Sustainable urban freight transport with autonomous zero-emission vessels

EUROPEAN UNION

Welcome to the AVATAR Newsletter No. 3 | Milestone! | Dissemination events | Publications

On our own account: AVATAR Newsletter No. 3 launched

Picture: AVATAR project

04.05.2022 –The AVATAR project consortium is publishing project newsletters at regular intervals, about three to four times a year, in which the main events, results, progresses made and general topics relating to the project are addressed. In this newsletter, an overview is given of several dissemination events and publications. An important milestone has been achieved (hull of the new AVATAR vessel), alignment took place with other projects and info on use cases is shared.

Read more here: AVATAR website, LinkedIn

Multimodal Urban Days Ghent

Picture: AVATAR project

16.11.2021 – One of the ambitions of the AVATAR project is to define and assess business cases for city freight distribution in the city of Ghent, using highly autonomous vessels. Therefore, an AVATAR colloquium was organized about the possibilities to integrate regional and local transport of construction materials (16/11/2021, havenhuis Gent). Speakers were invited from the government (City of Ghent, North Sea Port), European projects (AVATAR and ST4W), a local project (Via Palletto!) and private stakeholders (construction dealers, real estate companies). Not only technical issues were discussed, but also economic and energy issues. In total, 40 participants joined the colloquium.

There is a strong belief in Ghent by policy makers that using waterways for city freight distribution for construction materials can be successful, but there are still some points of attention. Reference is made to the need for appropriate loading and unloading equipment, but also the need for a reliable water level in the city.

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Carl Verhamme (Via Palletto!) presented the Via Palletto project, with focus on a regional multi-stop river shuttle and neutral integrator, with fixed routes, for pallets of building materials. In this concept, a large barge arrives at a Ghent distribution center and some of the cargo is distributed into the city using a small vessel. In the long term, the last-mile could be carried out with AVATAR highly autonomous vessels.

Urban Waterway Logistics (consortium of construction dealers) will play an important role in carrying out pilot cases for the Ghent region, in close alignment with the AVATAR project.

Thank you Peter Geirnaert for the excellent organisation of the colloquium!

Read more here: LinkedIn, AVATAR website, Use of waterways in Ghent, Via Palletto!

AVATAR @ IAME '21 Conference in Rotterdam

Picture: IAME 2021

26.11.2021 – As a sponsor of the IAME 2021 conference, AVATAR participated during an academic-industry interaction moment.

The aim of the hybrid conference was to bring together experts in all aspects of ports and maritime research, from all parts of the world and to stimulate the exchange of new ideas, relevant insights and cutting-edge research results.

On Friday 26/11/2021, the session "autonomous shipping" was organized during an academic-industry interaction moment. This session provided an overview of current challenges and multidisciplinary perspectives surrounding the development and future adaptation of smart and autonomous ships.

Presentations included (i) latest research developments (Vasso Reppa, TUDelft/RAS); (ii) smart shipping technology (Tom Pauwels, POM Oost-

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Vlaanderen, Project AVATAR); (iii) logistics perspectives (Antoon Van Coillie, ZULU Associates); and (iv) market uptake opportunities (Marco Scholtens, NL Smart Shipping Platform SMASH).

Read more here: LinkedIn 1, Linkedin 2, AVATAR website, IAME 2021, Industry meets science

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Energy use case – E. Van Wingen (YouTube)

Picture: AVATAR project and E. Van Wingen

1.12.2021 - One of the use cases in AVATAR focused on city freight distribution vessels sailing during daytime and charging the batteries at night (using a ICE CHP running on hydrogen). While the ICE CHP is charging the vessels, heat is released. In the AVATAR approach, this heat will be stored in a buffer tank that is part of a central heating installation. Project partner E. VAN WINGEN NV takes the lead for this use case.

A YouTube movie has been produced (in Dutch). The idea is that the (highly autonomous) vessels will run on renewable energy generated by large PV installations on warehouse rooftops and SME buildings located along the waterways outside the city center.

Read more here: LinkedIn, AVATAR website, Energy use case on YouTube

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AVATAR meets ZAWAS

Picture: AVATAR project and ZAWAS

7.12.2021 – During an online workshop on autonomous sailing (7/12/2021), the projects ZAWAS and AVATAR aligned and shared experiences.

Despite the difference in focus of both projects (passenger transport in ZAWAS, freight transport in AVATAR), several common challenges were identified:
=> How to deal with the current regulation?
=> How to create public acceptance that autonomous vessels will be sailing without a skipper?
=> How to make the concepts economically viable?

=> How to integrate the concepts in an urban environment?

ZAWAS aims to transform the waterways into rapid, zero-emission, autonomous public transportation transits in urban areas. AVATAR aims to test innovative and sustainable urban freight transport concepts with highly autonomous, zero-emission vessels in order to achieve a modal shift from road to water in an urban context on the last mile.

It has been agreed that ZAWAS and AVATAR will keep on informing each other and share in between results.

Many thanks to SAMS Norway, NCE Maritime CleanTech and Nordic Edge for this interesting workshop and the opportunity for Tom Pauwels and Thomas Brauner to present AVATAR.

Read more here: LinkedIn, AVATAR website, ZAWAS, SAMS Norway, NCE Maritime Cleantech, Nordic Edge

Interview Rotterdam Maritime Capital

Picture: Rotterdam. Maritime capital of Europe.

9.12.2021 – During the IAME 2021 conference in Rotterdam (see news item above), AVATAR project partner Tom Pauwels was interviewed by the Rotterdam Maritime Capital of Europe. Some insights of the AVATAR project are shared.

Read more here: LinkedIn, AVATAR website

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Masterclass Rotterdam Maritime Capital

Picture: Rotterdam Maritime Capital

23.12.2021 – In December 2021, a masterclass was organised by Rotterdam Maritime Capital of Europe about challenges that need to be addressed in the field of regulation, jurisdiction, financing and insurance in order to successfully bring about autonomous shipping.

AVATAR project partner Rudy Negenborn also gave input for the start of the panel discussion.

One of the identified challenges is cybersecurity, that should already be on top of mind during the design of a new autonomous vessel.

Read more here: LinkedIn, AVATAR website, Rotterdam Maritime Capital, Findings masterclass

Use Case Ghent in magazine INFORMEEL (Province of East Flanders)

Picture: Informeel, Province of East Flanders

12.01.2022 – The magazine "Informeel" of the Provincie Oost-Vlaanderen included an article (in Dutch) about the AVATAR project.

The focus of the article is on one of the use cases that will be developed: the economic assessment of using highly autonomous vessels for city freight distribution of construction materials in Ghent.

Reference is made to the East Flemish project partners Opleidingscentrum Hout en Bouw, Urban Waterway Logistics, E. VAN WINGEN NV and POM Oost-Vlaanderen.

Also long term perspectives are included by transferring the developed ideas to other cities in East Flanders.

Read more here: LinkedIn, AVATAR website, Article AVATAR in Informeel, Province of East Flanders

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Milestone! New hull arrived in Ghent

Picture: Opleidingscentrum voor Hout en Bouw vzw - Peter Geirnaert

31.01.2022 – Big milestone! The hull of the new AVATAR vessel has arrived in Ghent. Congratulations to project partner Peter Geirnaert!

One of the AVATAR goals is to build a new, highly automated vessel (load capacity 25 ton, zero-emission) to be used for city freight distribution.

In a next step, the team of E. VAN WINGEN NV will co-develop the new AVATAR vessel with the appropriate engine and equipment. SEAFAR will also be involved in this development and in the automation part. The universities KU Leuven, TU Delft and Carl von Ossietzky University of Oldenburg will do tests with the ship in the Living Lab Ghent. SSPA - Your Maritime Solution Partner is involved in tracking the performance data.

The goal is to start with real life tests in the city of Ghent with the new AVATAR vessel on 1/7/2022, in cooperation with other AVATAR project partners.

Read more here: LinkedIn, AVATAR website

Paper in the journal Frontiers in Robotics and AI


frontiers in Robotics and AI

ORIGINAL RESEARCH
published: 17 January 2022
doi: 10.3389/frobt.2021.739062

Dynamic Semantic World Models and Increased Situational Awareness for Highly Automated Inland Waterway Transport

Senne Van Baelen[1]*, Gerben Peeters[1], Herman Bruyninckx[1,2,3], Paolo Pilozzi[1] and Peter Slaets[1]

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Picture: Frontiers in Robotics and AI

11.02.2022 – Project partners Senne Van Baelen and Peter Slaets (KU Leuven) published an AVATAR related paper in the journal Frontiers in Robotics and AI.

The paper "Dynamic Semantic World Models and Increased Situational Awareness for Highly Automated Inland Waterway Transport" is available online and presents a set of methods to significantly enhance safe, highly-automated, close-encounter vessel manoeuvres.

The methods focus on shared automation, i.e. by

combining distributed sensor and navigational data within a vessel's local environment. Such shared knowledge can be exploited by a vessel's control system, remote control centres, monitoring services, among many others. For example, "vessel A" can take advantage from the environmental and/or navigational information obtained and shared by "vessel B", or by any actor for that matter.

Read more here: LinkedIn, AVATAR website, Paper in Frontiers in Robotics and AI

AVATAR in market review CCNR and EC

Picture: CCNR

11.03.2022 – The AVATAR Interreg North Sea Region project has been mentioned in the thematic report "An assessment of new market opportunities for inland waterway transport". The report has been written by Central Commission for the Navigation of the Rhine (CCNR), in partnership with the European Commission.

New markets in inland navigation become essential in the framework of a transition towards a more sustainable transport sector and a climate neutral Europe. The project AVATAR is indeed focusing on the new market of city freight distribution with highly autonomous vessels.

Chapter 2 of the report gives an overview of inland waterway transport embedded in urban logistics (with reference to AVATAR on page 57).

Thank you Norbert K. and Athanasia Zarkou (CCNR) for including the project AVATAR in the report, based on the interview with Thomas Brauner, Peter Geirnaert, Senne Van Baelen and Tom Pauwels.

Besides the topic on urban logistics, the market review contains also info about the existing markets of inland waterways (Chapter 1), circular economy and waste transport (Chapter 3) and new inland waterway cargo flows triggered by the energy transition (Chapter 4).

The project AVATAR will also take into account the lessons learned as described in Chapter 5, for example "Other technological developments, in

particular automation and digitalisation, could also play in favour of IWT in urban centres, in particular from a cost perspective (reduced labour costs when sailing during transshipment)."

Obstacles mentioned in the report (and to be taken into account by AVATAR project partners) are:
- Regulation and administrative costs;
- Economic viability;
- Competition for space with other economic sectors in cities;
- Road transport culture in logistics and lack of knowledge about IWT.

Read more here: LinkedIn, AVATAR website, Full report CCNR

Presentation at DeConTrans Conference

Picture: DeConTrans conference

28.03.2022 – At the final conference of the DeConTrans Project (28/3/2022), the project partner Janusz Piotrowski (Carl von Ossietzky University of Oldenburg) presented the AVATAR project.

The DeConTrans conference focused on innovative concepts for urban and regional inland navigation.

The conference included three keynote speeches on innovation projects from all over Germany. Besides the AVATAR project on city freight distribution with highly autonomous vessels, an overview was also given of the A-Swarm project (Autonome Elektrische Schiffahrt auf Wasserstrassen in Metropolregionen) by Tim Holzki and the SPS project (Smart Port Shuttle) by Daniel Rybarczyk.

The results of the DeConTrans project were presented and two additional lectures were given in

the context of urban supply of the future via waterways. The event was concluded by a panel discussion which dealt with the potentials of city logistics on the waterway and the conditions necessary for this.

Read more here: LinkedIn, AVATAR website, A-Swarm project, SPS project, DeConTrans project, DeConTrans Conference

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Participation at project "Lerende Euregio Scheldemond"

Picture: AVATAR project

20.04.2022 – In the AVATAR project, focus is on highly autonomous vessels for city freight distribution by combining research on engineering and economic assessment. From that perspective, project partners Tom Pauwels (POM Oost-Vlaanderen) and Peter Geirnaert (OHB and Urban Waterway Logistics) were asked to participate during a Flemish-Dutch brainstorm meeting on the setting up of an educational program for stakeholders involved in city freight distribution via water.

Inland navigation is characterized by a lack of crew, but will also be confronted with the need for specialized profiles in case of highly autonomous sailing. Future educational programs will have to take this into account; international cooperation between educational organisations for this might be an added value.

The event took place at the Maritieme Academie Harlingen on 19-20/4/2022 and was organised in the framework of the interreg Vlaanderen-Nederland project Lerende Euregio Scheldemond, with participation of (amongs others) HOGENT and Maritiem en Logistiek College De Ruyter.

Thank you Jorn Boll and Arjen Mintjens (Maritieme Academie Harlingen) for the friendly welcome and the demonstration of the inland navigation simulator!

Read more here: LinkedIn, AVATAR website, Maritieme Academie Harlingen, Interreg Vlaanderen-Nederland project Lerende Euregio Scheldemond, HOGENT, Maritiem en Logistiek College De Ruyter

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ZIA German property federation

Picture: LIHH

26.04.2022 – AVATAR project partner Thomas Brauner (Logistics Initiative Hamburg) presented on 26/4/2022 the AVATAR project and its use cases at the logistics real estate working group of ZIA German Property Federation, taking place in Hamburg.

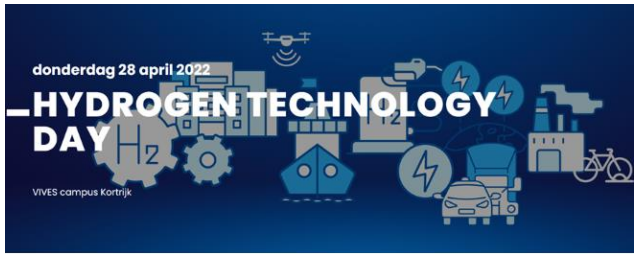
ZIA represents the interests of the entire real estate industry in terms of regulatory and economic policy. It promotes and supports suitable measures to maintain and improve the economic, legal, fiscal and political environment of the real estate industry throughout Germany.

Thomas Brauner, presenting AVATAR during the event, showed the progress of the project since its start in 2020, such as the market review, the identified use cases for parcel delivery pilots and retail shuttle pilots in the upcoming years in follow-up projects.

The most important takeaway for the working group participants was the potential of urban vessels functioning as transport units as well as temporary and mobile micro depots in city centres. The event was hosted by GARBE Industrial Real Estate GmbH, a member organisation of Logistics Initiative Hamburg. The participants were representatives of logistics companies, real estate industry and association representatives.

Read more here: LinkedIn, AVATAR website, ZIA German Property Federation, GARBE Industrial Real Estate GmbH

E. Van Wingen @ Hydrogen Technology Day



Picture: Frontiers in Robotics and AI

28.04.2022 – The team of AVATAR project partner E. Van Wingen was present during the Hydrogen Technology Day (28/4/2022) at Hogeschool VIVES (campus Kortrijk, Belgium).

During this event, participants discovered the possibilities of hydrogen use for companies. Several workshops were organised.

During the network session, it was possible to

meet the team of E. Van Wingen and talk about their AVATAR contribution (see also message above about the Energy use case).

Read more here: LinkedIn, AVATAR website, Hydrogen Technology Day

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Focus: on – Last mile on the water (AVATAR conference 4 May 2022)

Picture: LIHH

04.05.2022 – The potential of revitalizing urban canals and waterways for city freight distribution is nowadays being tested and piloted in many regions of Europe.

The Logistics Initiative Hamburg and AVATAR organised the Focus:On conference to present current examples, use cases and solutions developed within the AVATAR project and beyond.

In addition to the presentations of the AVATAR project (Thomas Brauner, Tom Pauwels and Peter Slaets), Athanasia Zarkou (Central Commission for the Navigation of the Rhine, CCNR) and Julius Kuechle from Fraunhofer CML presented the brand new thematic report (see also message above) on new market opportunities for inland waterway transport as well as the results of the comprehensive feasibility study "Water Cargo Barge" in Hamburg. Hendrik Lüth elaborated on Hamburg's strategy for the last mile.

The event took place in Hamburg on 4 May 2022.

Thank you Thomas Brauner and the Logistics Initiative Hamburg team for the organization of this AVATAR and focus:on conference!

Read more here: LinkedIn, AVATAR website, CCNR, Fraunhofer CML, Info Hamburg event

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Get to know the project partners. SSPA and KU Leuven

Picture: SSPA

Maritime knowledge based SSPA leads the way now that the international shipping industry is in for some radical changes. To meet UN's climate goals, SSPA performs research and assists many ship owners, operators, and other stakeholders across the globe to find out about wind

propulsion, hydrodynamics, routing, logistics, systems engineering, design and training, risk and safety. With 80+ years' of experience, SSPA use their databases, test facilities, laboratories and know how to support the development of a more sustainable maritime future.

SSPA has 90 employees, a head office in Gothenburg and a branch office in Stockholm. The company is owned by RISE.

Read more here: SSPA website, RISE

KU LEUVEN
IM Intelligent Mobile Platforms

Picture: KU Leuven

The Intelligent Mobile Platform (IMP) research group of KU Leuven aims at designing and controlling the mobile platforms of the future with a special focus on inland waterway shipping.

The multi-disciplinary research group lead by Prof. Peter Slaets tries to leverage their current research fleet towards real-life experimental validation of research results in various domains going from real-time identification, world modeling and increased situational awareness approaches to advanced model based control design. Due to this experimental validation driven approach, industrial collaborations and applied research projects (like AVATAR) are fully within the IMP scope.

Over the last few years, IMP's research was mainly focused on one vessel type: a Watertruck+ scale model called the Cogge. The AVATAR project is vital enabler for extending this research context, that is, by developing a new type of vessel (Catamaran), experimenting with various sensor compositions and data flows, and by increasing the autonomy of the research fleet.

KU Leuven is leading the engineering work package of AVATAR, focusing on (urban) vessel developments, and aligning collaborative efforts on increased automation and fleet coordination. As such, the IMP group aims to streamline these efforts towards an integrated demonstration of the associated technologies during the final months of the AVATAR project.

Read more here: KU Leuven (IMP Research Group)

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About the Interreg AVATAR project

AVATAR – Autonomous vessels, cost-effective transhipment, waste return. AVATAR is a project co-funded by the INTERREG North Sea Region Programme 2014 - 2020.

The AVATAR project aims to tackle challenges of city freight distribution by developing, testing and assessing adequate technologies and business models for urban autonomous zero-emission IWT. Through this, the project unlocks the economic potential of urban vessels and corresponding waterways, increases available solutions for full-cycle automation and sets up a sustainable supply chain model for urban goods distribution and waste return.

Further information and project news can be found on the project website and LinkedIn

https://northsearegion.eu/avatar

https://www.linkedin.com/company/avatar-interreg-north-sea-region

A general status of the project is available via this *link*.

Contact for queries

To get in touch with AVATAR, please contact the lead beneficiary organisation.

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