Project Manual

Hybrid Intelligence

Contents

1 Introduction 3

2 Summary of the Hybrid Intelligence programme 3

3 HI Vision 4

4 HI research agenda 4

5 What is not in scope 4

6 HI Consortium Composition 4

7 HI Project organisation 5
- 7.1 Management structure . . . 5
- 7.2 Co-supervision structure . . . 5
- 7.3 Four HI research objectives . . . 5
- 7.4 HI Matrix structure . . . 6
  - 7.4.1 Challenges . . . 6
  - 7.4.2 Special interest groups (SIG) . . . 7
  - 7.4.3 Case studies . . . 8
- 7.5 Personnel . . . 9
  - 7.5.1 Onboarding new personnel . . . 9
  - 7.5.2 PIF form and ISAAC . . . 9
  - 7.5.3 Data management plan . . . 9
  - 7.5.4 Who is who . . . 9
- 7.6 PhD training program . . . 10
  - 7.6.1 PhD supervisor policy . . . 10
  - 7.6.2 Graduate schools . . . 10
  - 7.6.3 Internships . . . 10
  - 7.6.4 PhD and PD budget . . . 11
  - 7.6.5 Engineering funds . . . 11

8 Communication 12
- 8.1 Internal Communication . . . 12
  - 8.1.1 Internal Communication Channels . . . 12
  - 8.1.2 Mailing lists . . . 12
  - 8.1.3 Messaging platform . . . 12
  - 8.1.4 Document collaboration . . . 13
  - 8.1.5 Meetings . . . 13
- 8.2 External Communication . . . 13
  - 8.2.1 External Communication Channels . . . 13
  - 8.2.2 General Rules for Communications and Publications . . . 14
  - 8.2.3 Procedures per publication type . . . 15

1 Introduction

Based on the Project strategy, the Quality Strategy, and the Communication Strategy, the Project Manual contains the information that our HI members, matrix leads, and coordinators require to make the project a success. Thus, it describes our management structure, our co-supervision structure, how the onboarding/exit procedures work, what and how we support the development of the people working for the consortium, our data management plan, and it concretely describes how to communicate the project outcomes within the consortium and to our external stakeholders. These processes are supported by templates, lists, and tools to make the procedure accessible and transparent. Standard Operating Procedures are part of the Project Manual to ensure the project's quality of onboarding consortium members, internal communication, and outcomes.

The Project Manual contains the following:

- Summary of the HI programme that includes its vision, mission, partners, management structure, and co-supervision structure
- Personnel, including information about onboarding, exit interviews, but also about mentoring, and the personal development of its junior and mid-career academic staff
- PhD training and mobility programme

The purpose of the Project Manual is to help the HI consortium members achieve the high impact that the Dutch society can expect from a project in the prestigious Gravitation programme of the Ministry of OCW.

2 Summary of the Hybrid Intelligence programme

Hybrid Intelligence (HI) is the combination of human and machine intelligence, expanding human intellect instead of replacing it. HI takes human expertise and intentionality into account when making meaningful decisions and performing appropriate actions, together with ethical, legal and societal values. Our goal is to design Hybrid Intelligent systems, an approach to Artificial Intelligence (AI) that puts humans at the centre, changing the course of the ongoing AI revolution.

Over the past decade, researchers in AI have made ground-breaking progress on long-standing problems. Now that AI is increasingly becoming part of our daily lives, we need to avoid being ruled by machines and their decisions. By providing intelligent artificial collaborators that interact with people, we strengthen our human capacity for learning, reasoning, decision making and problem solving. This interaction has the potential to amplify both human and machine intelligence by combining their complementary strengths. HI requires meaningful interaction between artificial intelligent agents and humans to negotiate and align goals, intentions and implications of actions.

The Hybrid Intelligence Centre is a collaboration of top AI researchers from the VU Amsterdam, the TU Delft, and the Universities of Amsterdam, Groningen, Leiden, Utrecht and Twente, in areas such as machine learning, knowledge representation, natural language understanding and generation, information retrieval, multi-agent systems, psychology, multi-modal interaction, social robotics, AI and law, and ethics of technology. The HI centre is creating a national and international focus point for research on all aspects of Hybrid Intelligent systems.

Developing HI requires fundamentally new solutions to core research problems in AI: current AI technology surpasses humans in many pattern recognition and machine learning tasks, however it falls short on general world knowledge, common sense reasoning, and human capabilities such as collaboration, adaptivity, responsibility and explainability (CARE).

3 HI Vision

The HI centre will create a national and international focus point for research on all aspects of Hybrid Intelligent systems. By creating intelligent machines that interact with humans, we aim to give people new, intelligent artificial collaborators for joint reasoning to optimize decision making and problem solving. This interaction has the potential to amplify both human and machine intelligence by combining their complementary strengths. HI focuses on the assistive and collaborative role of AI, emphasizing its potential to enhance human intelligence instead of replacing it.

4 HI research agenda

A Research Agenda for Hybrid Intelligence: Augmenting Human Intellect With Collaborative, Adaptive, Responsible, and Explainable Artificial Intelligence IEEE Computer, Aug. 2020, vol. 53, pp. 18-28. Zeynep Akata, Dan Balliet, Maarten de Rijke, Frank Dignum, Virginia Dignum, Guszti Eiben, Antske Fokkens, Davide Grossi, Koen Hindriks, Holger Hoos, Hayley Hung, Catholijn Jonker, Christof Monz, Mark Neerincx, Frans Oliehoek, Henry Prakken, Stefan Schlobach, Linda van der Gaag, Frank van Harmelen, Herke van Hoof, Birna van Riemsdijk, Aimee van Wynsberghe, Rineke Verbrugge, Bart Verheij, Piek Vossen, Max Welling.

5 What is not in scope

Our goals are to understand HI, to learn how to build HI systems, and how to build and use them responsibly. Even with these ambitious goals, there are topics which are outside the boundaries of our programme.

- Interface technology: We will use state-of-the-art software and hardware, both academic and commercial, for interface technology, embedded systems and Internet of Things. We expect to make extensive use of state-of-the-art software for speech recognition and generation, posture and gesture recognition and communication by avatars.
- Robot platforms: We will use robots for experiments with embodied communication using state of the art commercial robot platforms.
- Cognition: A thorough understanding of aspects of human cognition is crucial for the design of HI systems (e.g. theories on human attention, multitasking, perception etc), and we will make use of state-of-the-art scientific theories and insights on these topics. Expert knowledge on these is available in the consortium.

6 HI Consortium Composition

The HI Consortium comprises the following partners:

- Vrije Universiteit Amsterdam
- Technische Universiteit Delft
- Universiteit Utrecht
- Universiteit Leiden

- Rijksuniversiteit Groningen
- Universiteit van Amsterdam
- Universiteit Twente

7 HI Project organisation

7.1 Management structure

The highest decision making body of the consortium is the Executive Board, consisting of all principal investigators (www.hybrid-intelligence-centre.nl/team/).
Daily management is in the hands of the management team, consisting of Wendy Aartsen (projectmanager.at.HI@gmail.com), Frank van Harmelen, Catholijn Jonker and Erman Acar (HI-MT@googlegroups.com).
Budget information per institute per project is available from our project manager as well as the current status of the budget.

7.2 Co-supervision structure

Each of the PhD students in the project has a primary supervisor from one of the research institutes, and will also have a co-supervisor from another institute. We have successful experience with such dual supervision in other nationwide projects, captured in our HI Supervision Policy.

7.3 Four HI research objectives

The HI challenges are being addressed in four key themes in of the HI research: Collaborative, Adaptive, Responsible and Explainable HI (CARE).

- **Collaborative HI**: How do we develop AI systems that work in synergy with humans?
  We develop shared mental models for communication between humans and agents, computational theories of mind to enable collaboration, and exploit multimodal interaction for seamless dialogues.

- **Adaptive HI**: How can these systems learn from and adapt to humans and their environment?
  The world in which Hybrid Intelligent systems operate is dynamic, as are the teams of humans and agents that make up such HI systems. HI systems thus need to operate in situations not anticipated by their designers, and cope with variable team configurations, preferences and roles. This requires progress in online reinforcement learning, auto ML, and the integration of learning and reasoning.

- **Responsible HI**: How do we ensure that they behave ethically and responsibly?
  Addressing and mitigating some of the perceived risks of Artificial Intelligence technologies requires ethical and legal concerns to be an integral part of the design and operation of HI systems. Values such as transparency, accountability, trust, privacy and fairness can no longer be relegated to regulations that apply after system's deployment. We develop methods to include ethical, legal and societal considerations into the design process ("ethics in design") and into the performance ("ethics by design") of HI systems.

- **Explainable HI**: How can AI systems and humans share and explain their awareness, goals, and strategies?
  Intelligent agents and humans need to be able to mutually explain to each other what is happening (shared awareness), what they want to achieve (shared goals), and what collaborative ways they see of achieving their goals (shared plans and strategies). The challenge is to generate appropriate explanations in different circumstances and for different purposes, even for systems whose internal representations are vastly different from human cognitive concepts. We use causal models for shared representations, develop methods for contrasting, selective and interactive explanations, and combine symbolic and statistical representations.

7.4 HI Matrix structure

The HI research is organised in a matrix structure, to foster a scalable organisation accommodating the growth of the HI Centre, while still addressing the CARE themes described above. The Matrix structure of the HI centre is an evolution of the original four CARE Research Lines into: (i) core scientific HI Challenges; (ii) which are crosscut by Special Interest Groups (SIG) that focus on specific AI techniques, and (iii) evaluated in Case Studies to anchor our research in concrete societal situations. Over time, the different clusters, interest groups, and case studies may change, depending on developments in the field.

7.4.1 Challenges

The core scientific HI challenges are listed below:

- **Collaboration and Synergy** - In this challenge, we aim to provide a platform for research efforts directed at understanding, designing, developing, and evaluating the capacity of Hybrid Intelligent systems to facilitate collaboration with synergistic outcomes between different actors that complement each other. We take an inclusive view on the topic, where relevant interactions can take a wide variety of forms, e.g., comprising any number and combination of human-agent(s), human-human, or agent(s)-agent(s) as actors, and by including a broad spectrum of communication types, ranging from asynchronous unimodal communication all the way to fully synchronous multimodal exchanges. Importantly, we champion an interdisciplinary perspective, bridging fundamental and applied technological research with knowledge from the behavioural sciences related to human cooperation and teamwork.

- **Dialogue** - The Dialogue challenge addresses the research objectives of collaborative HI and of explainable HI. HI scientists are connected, working on various aspects related to dialogues, such as long-term interaction, text versus dialogue, human-agent interaction and human-robot interaction, and knowledge representation for dialogues.

- **Trust Trustworthiness** - In this challenge, we aim to inform the creation of trustworthy HI, build and calibrate trust in human-AI systems. Our mission encompasses work at three key levels. Firstly, trustworthiness of technical HI advances: we aim to develop technical components of HI systems that are verifiably properties that promote trustworthiness, including (but not limited to) transparency, explainability, safety, and fairness. Secondly, trustworthiness of human-AI interactions, interfaces, and the relation to the calibration of appropriate trust: we aim to understand how we can build systems that can actively understand how they are trusted, and which can interact with users in such a way that trust is calibrated to avoid situations of under- and overtrust. Thirdly, trustworthiness of the broader sociotechnical system in which HI operates: we aim to understand the broader organizational and institutional factors that enable

trustworthiness of HI technologies and interactions, and the calibration of trust at the use level, to inform the development and evolution of AI governance mechanisms.

- **HI Methodologies and Metrics** - Our mission is to establish Hybrid Intelligence as a methodology, where "methodology" refers to "the rationale for the research approach, and the lens through which the analysis occurs." Establishing the methodology includes, among other things, developing design patterns, shared ontologies, quality models (which can be further refined into measures and metrics) for HI systems. In other words, this challenge focuses on meta-level constructs, i,e., constructs that are not specific to a specific HI system or project, but they can be applied to a variety of HI systems. Examples of MM projects are the HI Quality model (Davide Dell'Anna), the HI Terminology (Ilaria Tiddi), the HI Hackaton (Jasper van der Waa), the Generative HI paper (Catholijn Jonker, Max van Duijn).

7.4.2 Special interest groups (SIG)

There are four Special Interest Groups (SIG) that focus on specific AI techniques:

- **Reinforcement Learning** – Applying machine learning, especially reinforcement learning techniques in the context of Hybrid Intelligence can be difficult: e.g. there are no big data sets about people's behaviors, or how they cooperate in a team, and due to good reasons (privacy concerns, etc.) it is not likely that they will arise any time soon. This SIG is dedicated to reinforcement learning and open to other relevant machine learning techniques for adaptive HI systems. It connects all members of the HI project that are interested in such learning techniques, either as object of study or as tool.

- **NLP4HI** – Natural Language Processing (NLP) is rapidly becoming the foundation of various HI systems, impacting fields such as democracy, healthcare, and law. As NLP technologies advance, understanding how humans and AI can process and utilize language to communicate, cooperate, and achieve goals is crucial. This SIG is committed to progressing both foundational and applied research at the intersection of NLP and HI. Our discussion will focus on the evolution of human-AI collaboration through the lens of NLP, asking how to develop real-world HI systems that understand, generate, and reason with language effectively, as well as how to engage with current state-of-the-art methods such as LLMs practically and ethically. Special attention will be given to how HI-NLP methods can enhance human deliberation, argumentation, and collective decision-making.

- **Ethics and System Design** – This challenge focuses on the normative dimensions of Hybrid Intelligence systems, related to research, development and its potential use in practice. In recent years, the ethics of AI systems has become a richly pursued topic. Doing justice to the social, ethical and legal/political aspects of Hybrid Intelligence requires taking a broader lens that situates a particular application in its broader context, including various stakeholders and their values and needs, as well as the growing number of institutional governance requirements (such as the AI Act or algorithm registers). In this SIG, we can address any needs to discuss or address such aspects. We invite colleagues from ethics and philosophy to help us articulate specific challenges. We bring in tools and methods from sociotechnical system theory and design to help us enrich our own basis for analysing and designing problems and solutions related to Hybrid Intelligence. As such, the SIG allows for learning and building common awareness of the normative dimensions, and it may inform how we do research and design Hybrid Intelligence in a more responsible and situated fashion.

- **Theory of Mind** – Theory of Mind (ToM) is the ability to attribute mental states to others, to make sense of their behaviour and perspectives on the world. It is one of the building blocks of

an intelligent system: one needs to be able to consider others' perspectives to know how they will respond to one's actions, which is beneficial in nearly any interaction, including cooperation and competition. In the literature, aspects of ToM are also referred to as, for example, 'perspective taking', 'user/mental models', 'mind-reading' and 'intention recognition'. Within HI, we mostly concern ourselves with using ToM to benefit the collaboration and communication between robots, agents, and humans. ToM is, in this sense, largely aligned with the Collaborative HI theme, but it also has strong ties to the Adaptive and Explainable HI themes. Within the SIG ToM, we organise 2-3 meetings per semester, in which we read and discuss papers and share updates about relevant conferences, publications, etc. We also keep an "inventory" of what individual projects do with ToM and we reach out to HI researchers for ToM-related collaborations.

7.4.3 Case studies

In the following Case Studies our research is applied in concrete societal situations:

- **Case study Health – Diabetes:** Diabetes is a chronic lifestyle related disease. A change of lifestyle requires intensive, personalised support involving both the patient and their social environment. A Hybrid Intelligent coach should help diabetes patients to adopt a healthier lifestyle while at the same time lowering the workload of healthcare professionals. A key challenge is the creation of multi-party dialogues between HI system, patient and healthcare professional that create long-term engagement. Explainability is crucial in this domain.

- **Case study Virtual Museum Guide:** The use case is about transforming museum learning through an intelligent virtual guide that fosters inclusive, immersive, and interactive cultural exploration. By leveraging multimodal interactions along with the acquisition, representation, and presentation of polyvocal knowledge, we aim to guide and accompany diverse audiences, making cultural heritage accessible, engaging and meaningful. Through the power of Hybrid Intelligence, we aim to create immersive, interactive digital environments that connect individuals to the stories and knowledge of varied cultures, ensuring that everyone, regardless of background, can experience, learn from, and contribute to the richness of global heritage.

- **Case study Robotic Surgery:** The aim of the use case is to create a human-agent coupled system capable of safely and effectively performing tasks in (micro)surgical environments. Specifically, the agent here refers to an exoscope on a robotic arm. Effective collaboration requires both the surgical team and the robotic agent to complement each others' skills in a dynamic environment. For instance, the robotic microscope has to learn how best to align its position, orientation, and zoom with the activities of the members of the surgical team. This requires a mutual understanding of each upcoming surgical procedure, which is acquired during prior practice sessions, as well as dynamic adaptation during the surgery itself. The case study necessitates an inherently interdisciplinary approach, spanning topics including shared planning and reasoning, mental models and theory of mind, multimodal nonverbal behavior dynamics, situated communication interfaces, continual and lifelong learning, and collaborative ontology determination.

- **Case study Scientific Assistant:** The aim of the scientific assistant is to support one or more steps in the scientific method cycle: formulating research questions, analysing the literature, formulating a hypothesis, designing an experiment, analysing data, and drawing conclusions. This will require a combination of symbolic and subsymbolic AI techniques, ranging from domain ontologies to deep learning, as well as theory of mind and shared planning to support the collaboration.

- **Case study Law:** Hybrid Law aims to apply the HI principles to the legal domain to strive towards societal goals such as access to justice. Most people do not know they are in a legal predicament until it is too late, and societal barriers can prevent them from getting the legal help they need. Creating legal HI systems can improve user literacy and help ordinary citizens in legal scenarios. HI systems can also assist legal personnel by helping them tackle an ever-expanding backlog of legal documents, which currently causes severe delays in justice. These Hybrid Law systems should make the right decisions for the right reasons, and be able to explain their reasoning for justice to occur. Furthermore, they require a human-centered design where the system adapts to the user for an effective and interactive collaboration.

7.5 Personnel

7.5.1 Onboarding new personnel

When a new member is joining the HI consortium, onboarding will be done in line with the HI Onboarding Procedure. For starting this, it is requested to provide the following information to the HI project manager:

- Name and email-address
- Affiliation
- Role in the project (staff, PhD, postdoc, supervisor, other)
- Type of funding (NWO, matching, associated)
- Start date

7.5.2 PIF form and ISAAC

According to the NWO guidelines, each new employee being paid from the NWO HI budget needs to be registered into the ISAAC system. In order to do so the project manager is kindly requesting you to complete the so called PIF form to be downloaded from the NWO website. This contains information on the employee, the affiliation, the start date and the duration of the project. Please make sure that the details of each employee will become available to the project manager shortly after their start on the project.

7.5.3 Data management plan

According to the NWO guidelines, for each project a data management plan is mandatory. The data management plan template can be downloaded from the NWO website. Once completed the template can be returned to the HI project manager, who will take care of the correspondence with NWO. Please provide the details shortly after the start of your project. Annual checks and reporting on the status of the data management for your project will be part of the reporting obligation to NWO.

7.5.4 Who is who

By means of introducing each other, to know who is working on which project and what are the research interests, we are collaboratively producing the 'HI people guide' or 'HI smoelenboek' at the who-is-who page on our website.
To complete the 'HI smoelenboek' please provide per person:

- Recent picture,

- Three-liner: who am I
- Involved in Hybrid Intelligence sub-projects: list.
- Hybrid Intelligence Challenge(s) you work on
- Role in the consortium
- Research interests
- Affiliations
- More information: e.g. personal URL, read these three publications

Please send your contributions to the HI project manager and it will be placed on the website.

7.6 PhD training program

The PhD training and teaching program of the HI Centre covers general skill development, scientific disciplinary knowledge and specialized topics, as well as ethics and responsible research practices. Please contact the HI education director Prof. Rineke Verbrugge for suggestions, questions, or more details.

7.6.1 PhD supervisor policy

Each PhD student, PD and (co)supervisor is expected to comply with the teaching and training guidelines and requirements of their home University as well as with the HI Supervision Policy.

7.6.2 Graduate schools

For the courses from the broader discipline, all HI Centre PhD students will have access to the course portfolio of the national research schools SIKS (Netherlands Research School for Information and Knowledge Systems, www.siks.nl) and Kurt Lewin (social psychology, www.kurtlewininstituut.nl). All of the universities participating in the HI Centre are members of the SIKS school, and most have access to the Kurth Lewin Institute portfolio. SIKS organizes a wide range of courses in the broad discipline of Information and Knowledge Systems on a regular basis (24 events in 2018 alone), and covers, among others, AI, information systems, human computer interaction, multi-agent systems and other areas relevant to Hybrid Intelligence. The Kurt Lewin Institute provides postgraduate courses on theory, methodology and practice of social psychology (17 events in the academic year 2018/2019 alone). All these courses of both national research schools are available to HI Centre PhD students. Beyond these broad courses, specialized courses in HI topics will be organized by senior HI Centre researchers, with a target of 3 such courses each semester. To ensure impact beyond the HI Centre, these courses will be co-hosted with the national research schools and will be open to other members of these research schools. Each of the participating Universities has a mature offering of courses on general skills such as scientific writing, presentation skills, grant writing, career development, etc. HI Centre PhD students will be able to benefit from these courses at their home University.

7.6.3 Internships

Internships at an external organisation can be a valuable part of a PhD/PD trajectory. Approval about timing, content and location of such an internship are up to the supervisors of the PhD/PD. If the internship is a paid position, then the contract of the PhD/PD should be suspended at their

university, and resumed at the end of the internship. Supervisors should inform the project manager about a planned internship before the start of the internship. This will allow us to get an overview of the role of internships in our training programme, we can inform NWO about the temporary contract suspension, and we don't need to worry about a PhD/PD being absent from consortium activities for the time of the internship.

7.6.4 PhD and PD budget

The budget for each 4-year PhD position and each 3-year Postdoc position includes salary costs, this budget for conference travel, education and training activities, project specific hardware, regular computing hardware (excluding compute servers or cloud computing) and other costs specific to the project. Please consult your university for their tariffs, and your rates. Some shared budget is available for larger expenditure such as computer servers (for shared use by the consortium) and for experimentation fees. These funds are managed by the Management Team (HI-MT@googlegroups.com) under the ultimate approval of the Executive Board. For some expenses (such as experimentation fees and engineering projects, see below), we run a matching-contributions scheme: costs paid from an individual budget can be topped up with a matching contribution from the shared budget. In case you would apply for the experimental fees please contact the HI project manager.

7.6.5 Engineering funds

Our current engineering efforts span multiple Matrix Elements. The SHARPIE project within SIG-RL is developing a modular platform for human-in-the-loop reinforcement learning; it already features a working codebase and is emerging as a shared experimental platform across diverse use cases. The Robotic Surgery project is tackling complex engineering challenges to build a cross-campus, multimodal data capture and virtual training environment that supports collaborative human-robot interaction in surgical settings. The Dialogue VR Museum and Health – Diabetes projects are advancing human-agent communication on distinct platforms, with opportunities for shared modules and design patterns. Meanwhile, the CoSy and Scientific Assistant projects are in early stages of development.

In the upcoming engineering funding round, we aim to consolidate these efforts and launch new initiatives that align technical development with the broader goals of Hybrid Intelligence. The HI Scenarios Platform will provide an online environment for researchers and the public to collaboratively define, evaluate, and compare HI systems using shared properties and metrics. The Bubble Board project enables hybrid reasoning in group ideation settings through multimodal interaction and integration with platforms like VR Museum and Leolani. The SHARPIE Round 2 proposal seeks to transform the existing proof-of-concept into a robust, modular platform for studying human-agent collaboration in reinforcement learning. The Twin OR extension advances the Robotic Surgery case by implementing real-time synchronization to support collaborative research and training. Finally, the Museum team is planning a multiplayer VR platform for multimodal data collection. Collectively, these projects aim to deliver reusable, interoperable tools, foster cross-domain synergy, and strengthen the open-source infrastructure within the Hybrid Intelligence GitHub ecosystem.

Yearly, new proposals for engineering funds can be submitted once the instructions are announced via the HI mailing list. These proposals should be for engineering support to initiatives that serve several projects within the HI consortium and demonstrate the functionality of HI systems.

8 Communication

8.1 Internal Communication

8.1.1 Internal Communication Channels

The following internal communication channels are used in the HI consortium:

- Regular meetings
- Slack messaging platform
- Mailing lists (a.o. consortium-wide and per research line, challenge or Special Interest Group)
- Regular newsletter
- Document collaboration
- HI website

8.1.2 Mailing lists

There is a number of mailing lists and email addresses available for internal communication:

Our consortium-wide mailing list: hybrid-intelligence-zwaartekracht@googlegroups.com.

Mailing lists per Challenge, per SIG, per case study :
You can join these mailing lists by sending an email to the Matrix Leads or HI project manager with your request.

Mailing list for PhD students: HI-PhD-students@googlegroups.com

The management team: HI-MT@googlegroups.com.

The project manager: projectmanager.at.HI@gmail.com (Wendy Aartsen).

Note: the names of our mailing groups are public (so that you can ask to join), but names of members and the content of the messages are all private to members only. All mailing lists have a searchable archive.

8.1.3 Messaging platform

The name of our Slack workspace is hybridintelligence.
You can sign in via https://hybridintelligence.slack.com/ or via the Slack application on your favourite OS (you will need to take out a free Slack account). You can request membership via the HI project manager.

8.1.4 Document collaboration

There are google drive folders for each Challenge, SIG and Case study, to share documents, meeting notes, data etc. google drive

Note: all of these folders are read and write for anybody who has the web-address, so take a bit of care: the link effectively works as a password (aka security-by-obscurity). This is run under the VU GSuite account, which means that Google does not look into the contents of your folders. Take into account that G Suite for Education is not suitable for privacy sensitive data.

8.1.5 Meetings

The consortium organises the following regular meetings presented in the HI google calendar:

- Consortium-wide meetings (three or four times per year), exchange research progress and results, discuss general direction and coherence of the research programme, all members are expected to participate
- Challenge (or cluster) meetings of the participants in each cluster (monthly). Discussion of joint research activities, detailed technical discussions and exchanges
- Special Interest Group meetings
- Case study Meetings
- PhD meetings (bi-weekly, also includes postdocs). Presentations and discussion of scientific literature and sharing of progress in individual research projects

8.2 External Communication

External communication should support the overall goals of the Hybrid Intelligence (HI) consortium and takes its Key Message to the target audience with the purpose to inform them about the project's achievements and initiatives. Next to informing, project communication may enhance the uptake of the project outcomes by stakeholders and provide nuance to the debate on Artificial Intelligence. Typical means of external communication are publications on project accomplishments, presentations at (inter)national events and contributions to opinion and discussion programs on radio and TV. Our Communication Strategy, Communication Policy, Communication Action Plan and associated forms and templates describe in detail how we design and deliver external project communication that speaks to the target audience and the HI stakeholders.

Some key aspects for project members are indicated in this project manual.

8.2.1 External Communication Channels

The following external channels will be used in the HI consortium:

- HI Website
- Scientific publications
- Scientific Presentations
- HHAI conference
- Regular HI Newsletter (external)
- Social Media (LinkedIn)
- Communication to the public (news)

8.2.2 General Rules for Communications and Publications

Depending on the nature and content of the communication, approval is needed from MT or Executive board. Details on these procedures are outlined in the HI procedure for Scientific Publications. Besides, it is important to consider IP matters and partner sensitivity prior to submitting your scientific publication. It is recommended that all communications and publications initiated within the HI consortium take into account the aspects below.

Acknowledgements .

The following acknowledgements should be taken into account:

- The Advisory Board experts' contribution, if applicable, will be acknowledged in communications by proper means.
- Other collaboration partners' contribution will be acknowledged in communications by proper means.
- NWO funding will be acknowledged in communications - publication (articles, reports, theses, conference contributions, presentations et cetera), in accordance with the General Terms and Conditions of NWO Grants:

  This publication is part of the project 'Hybrid Intelligence: augmenting human intellect' (https://hybrid-intelligence-centre.nl,) with project number 024.004.022 of the research programme 'Gravitation' which is (partly) financed by the Dutch Research Council (NWO).

Logos .

The HI logo, available on the HI platform is the common image of the project and should be used in all presentations and publications related to the project, as far as possible.

Hybrid Intelligence

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In addition, the NWO logo (see NWO Logo) is required in media used for external communication; articles in scientific journals or other instances with strict publication guidelines are exceptions.

Reporting of Publications .

Publications should be reported to the project manager (PM) by email as soon as they are published. The project manager ensures reporting to NWO and arranges listing on our website.

Reporting to the PM should be done to the PM as a BibTeX entry, and should alwas include the following fields: abstract=..., and doi=... or url=... (for a pointer to a downloadable PDF).

Open Access Publishing .

Our funding agency requires that all our publications are available under some form of open access. Open access publication costs can almost always be avoided through the following steps:

1. Check in https://journalpublishingguide.vu.nl/ (or https://library.wur.nl/WebQuery/jbrowser?q=* as an alternative) if you can publish Open Access (OA) for free. If it says "100 percent discount for VU authors" it's safe to assume this also applies to you.
2. Check in http://www.sherpa.ac.uk/romeo if this publisher allows uploading to your institutional repository. If that is the case, you can fulfill your obligation for open access publishing by uploading your paper to your institutional repository.
3. If neither of these holds, then (and only then) check if the venue allows you to pay an open access fee. Then ask the project manager by email for permission to pay the fees, and justify your request by (i) showing the negative results on steps 1 and 2; (ii) arguing why you really need to publish at this venue; (iii) quoting the required fee; and (iv) sending a copy of the paper explaining to which subproject this is related. If you get approval to pay the fees, you can declare this from your local funding, and at the end of the calendar year your university will get the fees refunded from central HI funds.

Publication Approval .
Due to the involvement of many partners, their opinion and stake in IP and/or patentable information you are kindly asked to complete the 'form for publication approval' to ensure that your publication is approved by all partners.

8.2.3 Procedures per publication type

Publications supported by HI .
If the work presented in a publication is supported by HI, through financial or in kind contributions, the following responsibilities and steps should be taken into account (mandatory):

- Confirm if the target journal or conference is on the journal or conference list, and add it if it is not on the list.
- In case of presentations or posters: use the applicable template for the publication.
- Prepare high-quality HI publications, gathering the input from all involved parties, being them internal or external to HI, and if needed, ensure via the Project Manager (PM) review by the related (co)leaders and the Executive Board (EB);
- State proper acknowledgements for publications *supported by* HI (see section 8.2.2)
- Ensure the correct logo's are included as needed (see section 8.2.2)

- Assess with your supervisor, relevant collaborators and the member(s) of the EB related to your institute(s) if the intended publication contains patentable issues or is partner sensitive. If yes, submit the draft publication to the PM for review by the Management Team (MT) and EB, respecting the review time before approval;
- Finalise the publication taking into account the input from all contributors in the review process;
- Version control draft publications.
- Ensure the publication is under Open Access, see section 8.2.2
- Report the publication to the PM (projectmanager.at.HI@gmail.com) as soon as it is published (mandatory). They should be reported to the PM as a BibTeX entry, see section 8.2.2.
- In case of a presentation or poster at a conference, write a short report on the event, the feedback received on the presentation, interesting contacts made and make the report available to the consortium on the project platform within 10 days after the event.

Publications on behalf of HI .
Publications *on behalf of* HI are publications or presentations that express for example general announcements, progresses, or reports, which pertain to the project altogether, or part of it, and present the opinions and consensual statements from the Consortium.

These publications should take into account the following responsibilities and steps (mandatory)

- All steps described for the publications *supported* by HI.
- As publication *on behalf of* HI represent the opinions of the Consortium, review and approval by the Management Team (MT) and Executive Board (EB) are mandatory prior to submission/publication/presentation. Complete the 'form for publication approval' (see section 8.2.2), and submit the draft publication to the PM for review by the MT and EB, respecting the review time, and allow sufficient time to obtain approval.

Publications related to HI .
As publications *related to* the HI consortium concern publications but do NOT contain outcomes or contributions that have been financially supported by HI, nor contain work conducted according to the HI Grant Agreement and the Description of Work, the steps described for publications *supported by* or *related to* HI are optional. It should be discussed with the supervisor which steps may apply and the MT should be consulted through the project manager on whether the publication should be reported for listing on the website.