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Jury de la soutenance

Jury fixé la dernière fois

- Olivier Simonin (A, président)
- Sylvain Chevallier (A, LISV, examinateur) OU Yann Chevaleyre (A, Dauphine, examinateur)
- Clément Moulin-Frier (B, INRIA Bordeaux, rapporteur)
- Alain Dutech (B, INRIA Nancy, rapporteur)
- Aurélie Beynier (B, SU, examinatrice)
- Jae Yun (B, ECE)
- Faiz (A, SU)
- Nicolas (A, SU)

Chercheurs en communication

- (examinateur) Marco Baroni (“language-mediated artificial intelligence”, research professor, Department of Linguistics, Pompeu Fabra University, Barcelone, https://marcobaroni.org/)
- Paul Van Eecke (“human-like communication in autonomous agents”, senior research fellow, Vrije Universiteit Brussel AI Lab, https://ai.vub.ac.be/team/paul-van-eecke/)
- (rapportrice) Katrein Beuls (“computational linguistics in multi-agent systems”, associate professor, University of Namur, https://directory.unamur.be/staff/kbeuls)

Manuscrit

- Intro
- [DONE] Chapitre 1: Reinforcement learning
  - [DONE] Overview of domain and trends
  - [DONE] Elements of RL
  - [DONE] Basic RL algorithms
  - [DONE] Neural networks
  - [DONE] Deep RL
- Chapitre 2: Multi-agent Deep RL
  - Multi-agent systems (definitions)
  - Issues in MAS
  - Deep MARL algorithms
- [(almost) DONE] Chapitre 3: JIM
- Chapitre 4: Language-Grounded MARL
- Chapitre 5 ?

Objectifs

- 12 juillet : Chapitres 1, 2 et 3 finis -> relecture
- Cet été : Travail et rédaction de Chapitres 4(,5?)
- Septembre, octobre: relectures
- Envoi du manuscrit mi-octobre

Multi-agent communication

MAC review

Review MAC : https://www.notion.so/Multi-agent-Communication-Related-works-022989377c5448328606b0a2cb8a0301

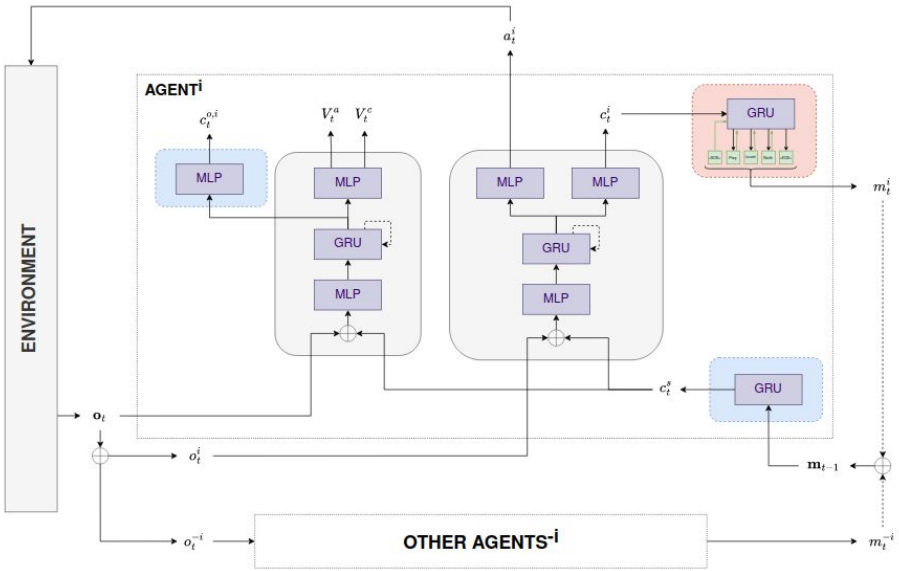
- Language type (emergent/pre-defined, continuous/discrete)
- Learning approach (RL, supervised, grounding)
- Communication interpretation methods
- Communication evaluation metrics (quantitative and qualitative)

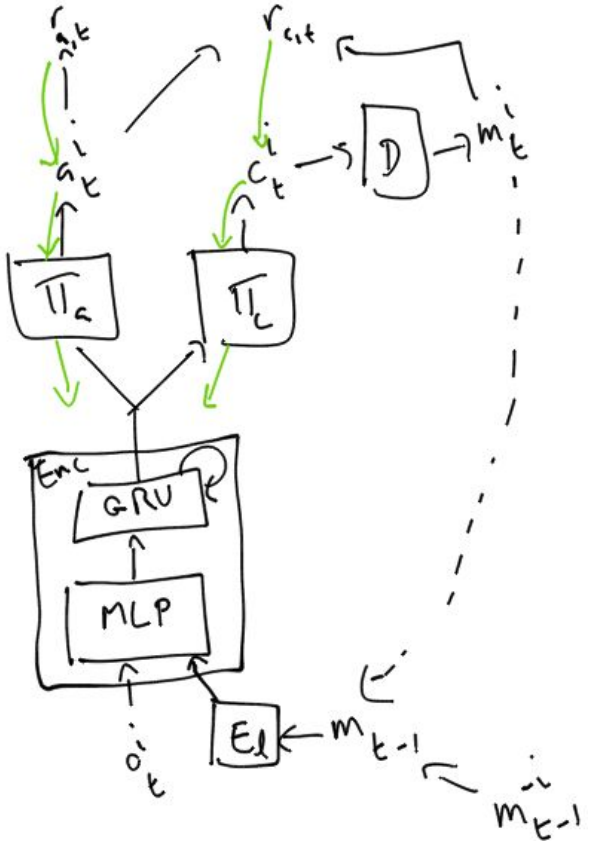
Multi-agent communication

Emergent communication approaches

Problem: Our emergent communication does not work

Our approach:



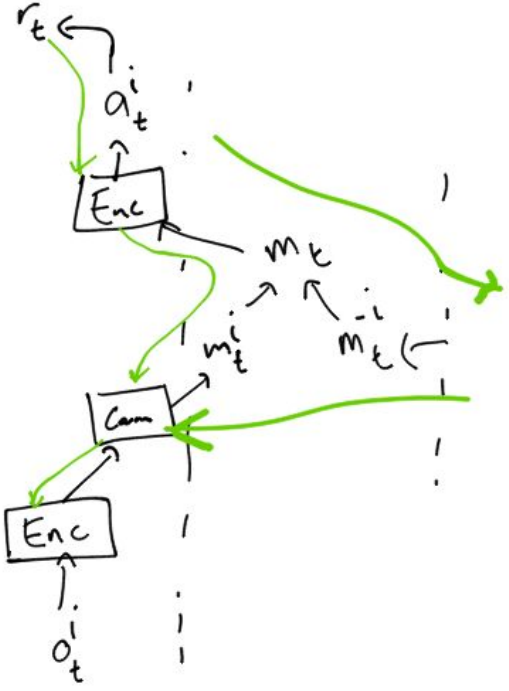


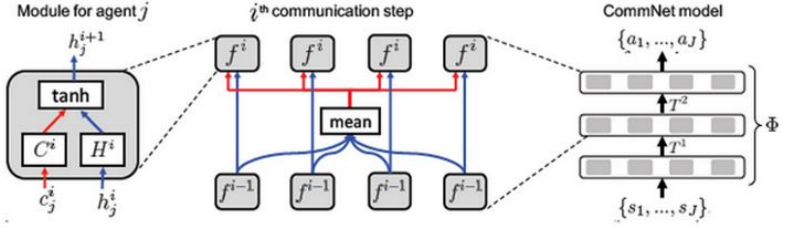
Multi-agent communication

Emergent communication approaches

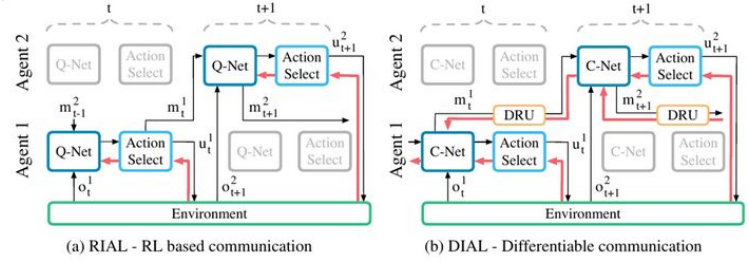
Main approach in literature: “Differentiable communication”

-> communication as a sub-module of the action selection





CommNet (Sukhbaatar2016)



(a) RIAL - RL based communication (b) DIAL - Differentiable communication

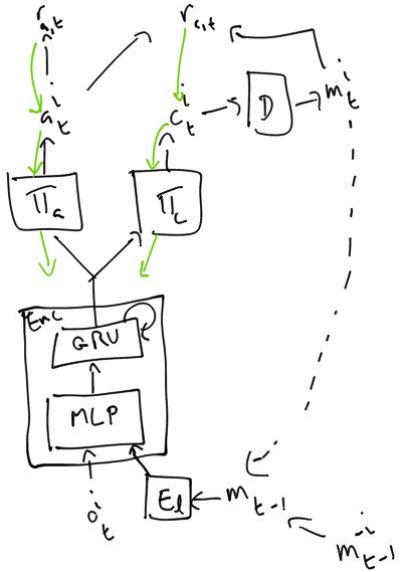
DIAL (Foerster2016)

Figure 1: In RIAL (a), all Q-values are fed to the action selector, which selects both environment and communication actions. Gradients, shown in red, are computed using DQN for the selected action and flow only through the Q-network of a single agent. In DIAL (b), the message m_t^a bypasses the action selector and instead is processed by the DRU (Section 5.2) and passed as a continuous value to the next C-network. Hence, gradients flow across agents, from the recipient to the sender. For simplicity, at each time step only one agent is highlighted, while the other agent is greyed out.

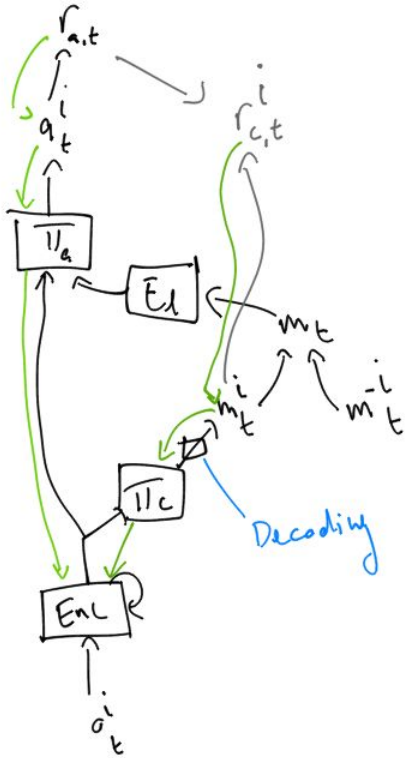
Multi-agent communication

Next steps for Language-Grounded MAC

- Do differentiable communication for Emergent communication
- Take inspiration from this for language communication ?



Better?



Thank you for you attention !

Questions ?