

# SHelC 2020

**Smart Health International Conference**

*Healthcare of the future!*

*La santé du futur !*

30<sup>th</sup> September – 2<sup>nd</sup> October 2020

Troyes, France

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## Program

|                                |               |                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                  |                                    |                               |                |                           |
|--------------------------------|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-------------------------------|----------------|---------------------------|
| Wed. 30th<br>september<br>2020 | 17:00 - 18:00 | Registration (part 1) - Troyes city center:<br><b>Cour du Musée d'Art Moderne - 14, place Saint-Pierre in Troyes</b>                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                  |                                    |                               |                |                           |
|                                | 18:00 - 20:00 | Welcome Reception in Troyes city center:<br><b>Cour du Musée d'Art Moderne - 14, place Saint-Pierre in Troyes</b><br>Mr. Marc Hastert, Secretary General of EAHM<br>Mr. Pierre Koch, President of University of Technology of Troyes (UTT)<br>Mr. Philippe Blua, Director of Hôpitaux Champagne Sud (HCS)<br>Mr. François Baroin, Mayor of Troyes, President of Troyes Champagne Métropole |                                                                                                                                                                                                                                                                                                                                                                                                  |                                    |                               |                |                           |
| Thu.<br>1st<br>October<br>2020 | 8:00 - 9:00   | Registration (part 2) - University of Technology of Troyes                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                  |                                    |                               |                |                           |
|                                | 9:00 - 10:00  | Opening session                                                                                                                                                                                                                                                                                                                                                                            | Prof. Farouk Yalaoui, Senior Vice President of UTT<br>Mr. Pierre Koch, President of UTT<br>Mr. Philippe Blua, Director of Hôpitaux Champagne Sud (HCS)<br>Mrs Zaynab Riet, General Delegate of Federation Hospitalière de France<br>Mr. Philippe Pichery, President of the Departmental Council of Aube<br>Mr. Frédéric Remay , Deputy director Regional Health Agency (ARS) of Grand Est region |                                    |                               |                |                           |
|                                | 10:00 - 10:50 | Plenary session 1 - Pr. Christian Rabaud, President of the Establishment Medical Committee of the Nancy CHRU - Forecasting models in the context of COVID-19<br>Chairperson: Prof. Lionel Amodeo                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                  |                                    |                               | Poster & Video |                           |
|                                | 10:50 - 11:10 | Coffee break<br>Hall M                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                  |                                    |                               |                |                           |
|                                | 11:10 - 12:00 | Plenary session 2 - Dr. Pascal Caillet, researcher at CHU of Nantes<br>National Health Data System (SNDS): what access and what study design?<br>Chairperson : Prof. Nathalie Sauer                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                  |                                    |                               |                |                           |
|                                | 12:00 - 14:00 | Lunch<br>Halle Sportive                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                  |                                    |                               |                |                           |
|                                | 14:00 - 15:30 | S1-1: Technology, robotics and healthcare                                                                                                                                                                                                                                                                                                                                                  | S2-1: Data driven healthcare                                                                                                                                                                                                                                                                                                                                                                     | S3-1: Healthcare Management System | S4-1: Service for the patient |                | S5-1: Industrial feedback |
|                                | 15:30 - 16:00 | Coffee break<br>Hall M                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                  |                                    |                               |                |                           |
|                                | 16:00 - 17:30 | S1-2: Technology, robotics and healthcare                                                                                                                                                                                                                                                                                                                                                  | S2-2: Data driven healthcare                                                                                                                                                                                                                                                                                                                                                                     | S3-2: Healthcare Management System | S4-2: Service for the patient |                | S5-2: Industrial feedback |
|                                | 19:30 - 23:30 | Gala: Restaurant Le Bois du Bon Séjour, 2 rue Roger Salengro<br>10 150 Pont-Sainte-Marie                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                  |                                    |                               |                |                           |

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|--------------------------------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|---------------------------------------------|----------------------------------|------------------------------|
| Fri.<br>2nd<br>October<br>2020 | 9:00 -<br>10:00  | Plenary session 3 - Dr. Amir Nakib, researcher at Université Paris Est Créteil<br>Large scale optimization for deep learning: application on healthcare<br>Chairperson: Prof. Hichem Snoussi                                                               |                                    |                                             |                                  |                              |
|                                | 10:00 -<br>10:30 | Coffee break<br>Hall M                                                                                                                                                                                                                                     |                                    |                                             |                                  |                              |
|                                | 10:30 -<br>12:00 | S1-3:<br>Technology,<br>robotics and<br>healthcare                                                                                                                                                                                                         | S2-3: Data<br>driven<br>healthcare | S3-3:<br>Healthcare<br>Management<br>System | S4-3: Service<br>for the patient | S5-3: Industrial<br>feedback |
|                                | 12:30 -<br>14:00 | Lunch<br>Halle Sportive                                                                                                                                                                                                                                    |                                    |                                             |                                  |                              |
|                                | 14:00 -<br>14:30 | History of Epidemics - Mr. Philippe Blua / Prof. Farouk Yalaoui - (English)                                                                                                                                                                                |                                    |                                             |                                  |                              |
|                                | 14:30 -<br>15:15 | European COVID 19 Crisis: Hospital manager feedback - Part 1<br>Mr. Philippe Blua (France) /<br>Mr. Marc Hastert (Luxembourg) / Prof. Ugo Luigi Aparo (Italie)<br>Chairpersons: Prof. Farouk Yalaoui                                                       |                                    |                                             |                                  |                              |
|                                | 15:15 -<br>15:30 | Coffee break<br>Hall M                                                                                                                                                                                                                                     |                                    |                                             |                                  |                              |
|                                | 15:30 -<br>16:15 | European COVID 19 Crisis: Hospital manager feedback - Part 2<br>Speakers: Mr. Alexandre Lourenço (Portugal) /<br>Dr. Georgia Oikonomopoulou (Greece) / Dr. Lajos Ari (Hungary)<br>Chairpersons: Mr. Marc Hastert, Mr. Philippe Blua, Prof. Farouk Yalaoui  |                                    |                                             |                                  |                              |
|                                | 16:15 -<br>17:00 | European COVID 19 Crisis: Hospital manager feedback - Part 3<br>Speakers: Mr. Gerry O'Dwyer (Ireland) /<br>Mrs Louise McMahon (United Kingdom) / Dr. Páll Matthíasson (Iceland)<br>Chairpersons: Mr. Marc Hastert, Mr. Philippe Blua, Prof. Farouk Yalaoui |                                    |                                             |                                  |                              |
|                                | Closing session  |                                                                                                                                                                                                                                                            |                                    |                                             |                                  |                              |

## Planning, Wednesday, 30 September 2020

**Welcome Reception at Troyes Center**  
**Musée d'Art Moderne - 14, place Saint-Pierre in Troyes**  
**Wednesday, 30 September 2020, 18:00-20:00**

Mr. Marc Hastert, Secretary General of EAHM  
Mr. Pierre Koch, President of University of Technology of Troyes (UTT)  
Mr. Philippe Blua, Director of Hôpitaux Champagne Sud (HCS)  
Mr. François Baroin, Mayor of Troyes, President of Troyes Champagne Metropole

## Planning, Thursday, 1 October 2020

### **Opening session**

**Thursday 1 October 2020, 9:00-10:00**

**Virtual room:** <https://www.sheic2020.com/op>

**Physical room:** Amphi M500

Prof. Farouk Yalaoui, Senior Vice president of University of Technology of Troyes (UTT)  
Mr. Pierre Koch, Director of University of Technology of Troyes (UTT)  
Mr. Philippe Blua, Director of Hôpitaux Champagne Sud (HCS)  
Mrs Zaynab Riet, General Delegate of Federation Hospitalière de France (FHF)  
Mr. Philippe Pichery, President of the Departmental Council of Aube  
Mr. Frédéric Remay, Deputy director Regional Health Agency (ARS) of Grand Est region

### **Plenary session 1, Thursday 1 October 2020**

**Virtual room:** <https://www.sheic2020.com/ps1>

**Physical room:** Amphi M500

**10:00-10:50**

#### **Forecasting models in the context of COVID-19**

Prof. Christian Rabaud, President of the Establishment Medical Committee of the Nancy CHRU

**Chairperson:** Prof. Lionel Amodeo

### **Plenary session 2, Thursday 1 October 2020**

**Virtual room:** <https://www.sheic2020.com/ps2>

**Physical room:** Amphi M500

**11:10-12:00**

#### **National Health Data System (SNDS): what access and what study design?**

Dr. Pascal Caillet, researcher at CHU of Nantes

**Chairperson:** Prof. Nathalie Sauer

## **The First Session: 14:00-15:30**

### **Session 1.1: Technology, robotics and healthcare**

**1 October 2020, 14:00-15:30**

**Chairpersons: Dr. Farah Chehade**

**Virtual room: <https://www.sheic2020.com/s11>**

**Physical room: A001**

- 14:00-14:20**    **Object Localization in Indoor Environments**, Daniel Alshamaa and Farah Chehade.#19
- 14:30-14:50**    **An Automatic Turn Phase Detection Method based on Doppler Radar System with CWT Analysis**, Racha Soubra, Aly Chkeir and Farah Chehade. #34
- 15:00-15:20**    **Evidential prediction of atrial fibrillation with rejection**, Mohamed Mroueh, Farah Chehade and Fahed Abdallah.#31

### **Session 2.1: Data driven healthcare**

**1 October 2020, 14:00-15:30**

**Chairpersons: Dr. Quy Nguyen**

**Virtual room: <https://www.sheic2020.com/s21>**

**Physical room: C001**

- 14:00-14:20**    **Manifold learning for Amyotrophic Lateral Sclerosis prognosis: development of a prognosis model**, Vincent Grollemund, Jean-François Pradat-Peyre, François Delbot, Gaétan Le Chat and Pierre-François Pradat.#1
- 14:30-14:50**    **Machine learning and big data analytics techniques to improve prediction in the field of medical remote monitoring**, Anna Karen Garate Escarmilla, Amir Hajjam El Hassani and Emmanuel Andres.#26
- 15:00-15:20**    **Visualizing electronic medical records of diabetic patients using pairwise similarity for explainable structuring**, Joris Falip, Sara Barraud and Frédéric Blanchard.#18

### **Session 3.1: Healthcare Management System**

**1 October 2020, 14:00-15:30**

**Chairpersons: Dr. Christophe Sauvey / Dr. Oumayma Bahri**

**Virtual room: <https://www.sheic2020.com/s31>**

**Physical room: N101**

- 14:00-14:20**    **Solving emergency department resources management using a joint simulation optimization approach**, Ibtissem Chouba, Farouk Yalaoui, Lionel Amodeo, Taha Arbaoui, Stéphane Sanchez and David Laplanche.#6

**14:30-14:50**    **A framework for chemotherapy planning optimization**, Quoc Nhat Han Tran, Quy Nguyen, Hicham Chehade, Frédéric Dugardin, David Laplanche, Stéphane Sanchez and Rezvan Sadeghi.#32

**15:00-15:20**    **Predictive-reactive strategy for operating rooms rescheduling**, Ayoub Tighazoui, Christophe Sauvey and Nathalie Sauer.#9

**Session 4.1: Service for the patient**  
**1 October 2020, 14:00-15:30**  
**Chairpersons: Dr. David Laplanche**  
**Virtual room: <https://www.sheic2020.com/s41>**  
**Physical room: B106**

**14:00-14:20**    **Suggested tools to help people with chronic illnesses return home or stay at home: a practical case of diabetes**, David Annebicque, Mohammed-Amine Haraoubia, Mohammed El-Saïd Berkani, Pr. Abdelaziz Hamzaoui.#20

**14:30-14:50**    **VNS-based algorithms for home care routing and scheduling problem with realistic constraints**, Sana Frifita and Malek Masmoudi. #4

**15:00-15:20**    **Facility location of healthcare providers of rural services in developing countries: Insights from a Mixed Integer Linear Programming (MILP) formulation**, Gonzalo Mejía, Daniela Granados, Gabriela Rico, Daniela Cuéllar, Nicolás Montes.#25

**Session 5.1: Industrial feedback**  
**1 October 2020, 14:00-15:30**  
**Chairpersons: Dr. Hicham Chehade**  
**Virtual room: <https://www.sheic2020.com/s51>**  
**Physical room: C103**

**14:00-14:20**    **Medimex, exoskeleton**, Audrey Chauffour.

**14:30-14:50**    **OMEDYS, Telemedicine: is the remote medical act a successful one? History, relevance and performance of teleconsultation**, Dr. Arnaud Devillard et Dr. Jérémy Goudour #39

**15:00-15:30**    **Pulsy: Parceo, the new health path for users in the East of France**, Gregory Thiebaut.

## **The second Session: 16:00-17:30**

**Session 1.2: Technology, robotics and healthcare**  
**1 October 2020, 16:00-17:30**  
**Chairpersons: Dr. Aly Chkeir**  
**Virtual room: <https://www.sheic2020.com/s12>**  
**Physical room: A001**



- 16:00-16:20**    **A Detrended Fluctuation Analysis to differentiate between a turn and straight path in the Timed Up and Go test,** Dona Bou Zeidan and Aly Chkeir.#35
- 16:30-16:50**    **Fieldwork and field trials in hospitals: Co-designing a robotic solution to support data collection in geriatric assessment,** Karine Lan Hing Ting, Dimitri Voilmy, Quitterie De Roll, Ana Iglesias and Rebeca Marfil. #23
- 17:00-17:20**    **Sound Sensor to Detect the Number of People in a Room,** Sami Boutamine, Dan Istrate, Jerome Boudy, Yoann Fousseret and Yves Parmantier. #30

**Session 2.2: Data driven healthcare**  
**1 October 2020, 16:00-17:30**  
**Chairpersons: Dr. Stéphane Sanchez**  
**Virtual room: <https://www.sheic2020.com/s22>**  
**Physical room: C001**

- 16:00-16:20**    **Clustering a health dataset based on diagnostic co-occurrences,** Adrien Wartelle, Farah Chehade, Farouk Yalaoui, David Laplanche and Stéphane Sanchez.#27
- 16:30-16:50**    **An unsupervised learning approach to hospital classification,** Jan Chrusciel, Adrien Le Guillou, Adrien Wartelle, David Laplanche, Sandra Steunou, Marie-Caroline Clément and Stéphane Sanchez.#22
- 17:00-17:20**    **IoT Data Assembly and Recording,** Vincent Zalc, Matthias Pideri, Dan Istrate, Carla Taramasco and Gaston Marquez.#29

**Session 3.2: Healthcare Management System**  
**1 October 2020, 16:00-17:30**  
**Chairpersons: Dr. Matthieu Godichaud / Mr. Laurent Dorigo**  
**Virtual room: <https://www.sheic2020.com/s32>**  
**Physical room: N101**

- 16:00-16:20**    **Optimization in hospital logistics: improving working conditions and employees well-being,** Fatima Abderrabi, Matthieu Godichaud, Alice Yalaoui, Farouk Yalaoui, Lionel Amodeo and Ardian Qerimi.#11
- 16:30-16:50**    **Optimization in hospital logistics: food production scheduling in hospital catering,** Fatima Abderrabi, Matthieu Godichaud, Alice Yalaoui, Farouk Yalaoui, Lionel Amodeo and Ardian Qerimi.#12
- 17:00-17:20**    **A Laundry Management for Hospital Supply Chain,** Nadia Ndhaief, Zied Hajej and Nidhal Rezg.#8

**Session 4.2: Service for the patient**  
**1 October 2020, 16:00-17:30**  
**Chairpersons: Prof. Atidel B. Hadj-Alouane / Dr. Frédéric Dugardin**  
**Virtual room: <https://www.sheic2020.com/s42>**  
**Physical room: B106**

- 16:00-16:20 Patient Flow Forecasting in an emergency department, Mohamed Afilal, Frédéric Dugardin, Farouk Yalaoui, Lionel Amodeo, David Laplanche and Philippe Blua.#15**
- 16:30-16:50 Generation of a benchmark fitting with HHC problem, Colin Huvent, Caroline Gagné and Aymen Sioud.#16**
- 17:00-17:20 Using Discrete Event Simulation to improve the performance of an Outpatient Department: Case study of a Tunisian public Hospital, Hana Ben Mbarek, Atidel B. Hadi-Alouane, Najla Aissaoui Omrane and Safa Bhar Layeb.#10**

**Session 5.2: Industrial feedback**  
**1 October 2020, 16:00-17:30**  
**Chairpersons: Mr. Marc Pavageau**  
**Virtual room: <https://www.sheic2020.com/s52>**  
**Physical room: M500**

- 16:00-17:30 ELODEA Ecosystem: Health logistics for sensitive medical products, integrated and unique solution using drones, for emergency and for regular flows.**

## Planning, Friday, 2 October 2020

**Plenary session 3, Friday 2 October 2020**  
**Virtual room:** <https://www.sheic2020.com/ps3>  
**Physical room:** Amphi M500

**9:00-10:00** **Large-scale optimization for deep learning: application on healthcare**  
Dr. Amir Nakib, researcher at Université Paris Est Créteil.  
**Chairperson:** Prof. Hichem Snoussi

### Session 10:30-12:00

**Session 1.3: Technology, robotics and healthcare**  
**2 October 2020, 10:30-12:00**  
**Chairpersons:** Dr. Murat Afsar / Dr. Faicel Hnaïen  
**Virtual room:** <https://www.sheic2020.com/s13>  
**Physical room:** E013

- 10:30-10:52** **Sensor Based Wearable Assistive Device for Visually Impaired People,** SP.Rajamohana, Zbigniew M. Wawrzyniak, E.G Radhika, S. Priya, S. Madhumita, and S. Surabhi.#2
- 10:52-11:16** **Cybersecurity: a major issue for the business continuity of healthcare establishments as well as for patient safety,** Lionel Prades #40
- 11:16-11:38** **Digital Technology Interventions for Risk Factor Modification in Patients with Cardiovascular Disease: a Systematic Review and Meta-Analysis,** Adewale S. Akinosun, Robert Polson, Yohanca Diaz, Johannes De Kock, Lucia Carragher, Stephen J. Leslie, Mark Grindle. #43
- 11:38-12:00** **Combined computational and driven-modelling modelling of blood coagulation to predict the response of individual patients to anticoagulant therapy,** Anass Bouchnita.#37

**Session 2.3: Data driven healthcare**  
**2 October 2020, 10:30-12:00**  
**Chairpersons:** Prof. El Ghazali Talbi / Dr. Mohsen Aghelinejad  
**Virtual room:** <https://www.sheic2020.com/s23>  
**Physical room:** C001

- 10:30-10:50** **Leveraging Blockchain Technology to Enhance Pharmaceutical Supply Chain Management,** Shayma Romdhani, Issam Nouaouri, Jihene Tounsi, Hamid Allaoui and Said Gattoufi.#36
- 11:00-11:20** **Measuring the expression of RNA sequences in hundreds of RNA-seq libraries at nucleotide resolution,** Mariam Bouzid, Daniel Gautheret and Rayan Chikhi.#13
- 11:30-11:50** **Clinical Laboratory Optimization,** Sohrab Faramarzi Oghani, El Ghazali Talbi and Eric Varlet. #28

### Session 3.3: Healthcare Management System

2 October 2020, 10:30-12:00

Chairpersons: Dr. Hicham Chehade/ Prof. Lionel Amodeo

Virtual room: <https://www.sheic2020.com/s33>

Physical room: A002

- 10:30-10:52** Fleet size and mix pickup and delivery problem with Time windows, Moise Tchoupo, Lionel Amodeo, Alice Yalaoui and Farouk Yalaoui.#5
- 10:52-11:14** OPTA Logistics: logiciel d'optimisation de la logistique hospitalière, Alice Yalaoui, Lionel Amodeo, Farouk Yalaoui, Moise Tchoupo, Pauline Flori, Philippe Blua, Hicham Chehade and Kévin Roy.#33
- 11:14-11:36** OPTA Urgences: un logiciel innovant de prévisions d'afflux de patients aux services d'urgences, Farouk Yalaoui, Lionel Amodeo, Frédéric Dugardin, Mohamed Afilal, David Laplanche, Philippe Blua, Hicham Chehade and Kévin Roy.#14
- 11:36-12:00** The impact of new technologies and hospital concentration on the risks of healthcare delivery organizations, Pierre-Yves Antier.#41

### Session 4.3: Service for the patient

2 October 2020, 10:30-12:00

Chairpersons: Dr. Taha Arbaoui / Dr. Auguste Rakotondranaivo

Virtual room: <https://www.sheic2020.com/s43>

Physical room: F101

- 10:30-10:50** A novel system for patient orientation to and in emergency departments, Taha Arbaoui, Hicham Chehade, Farouk Yalaoui and Alice Yalaoui.#7
- 11:00-11:20** Decision support tool for the food supply chain to prevent undernutrition in the elderly at home the elderly at home, Auguste Rakotondranaivo, Christine Miro, Sarah Ferhah, Mark Kennet and Nathalie Rouyer.#17
- 11:30-11:50** Towards Frailty Assessment using a Multimodal System?, Manuel Abbas, Majd Saleh, Dominique Somme and Régine Le Bouquin Jeannès.#21

### Session 5.3: Industrial feedback

2 October 2020, 10:30-12:00

Chairpersons: Dr. Yassine Ouazene

Virtual room: <https://www.sheic2020.com/s53>

Physical room: H014

- 10:30-10:52** Indoor Santé, PEP'IT: SaaS platform for the acquisition, management and distribution of sports and health data.
- 10:52-11:16** ASTALIA, the impact of France Relance on the financing of Smart Health projects.
- 11:16-11:38** H'ability, Virtual reality at the service of the handicap, Bérengère HENRION. #38
- 11:38-12:00** Mobility: Dedalus alongside healthcare institutions, Rajaa Doudou #42



**Friday 2 October 2020, 14:00-17:00**

**European COVID 19 Crisis: Hospital manager feedback**

**Chairpersons: Mr. Marc Hastert, Mr. Philippe Blua, Prof. Farouk Yalaoui**

**Virtual room: <https://www.sheic2020.com/s6>**

**Physical room: Amphi M500**

- 14:00-14:30**      **History of Epidemics – Mr. Philippe Blua / Prof. Farouk Yalaoui**
- 14:30-15:15**      **European COVID 19 Crisis: Hospital manager feedback - Part 1**  
Speakers: Mr. Philippe Blua (France) / Mr. Marc Hastert (Luxembourg) /  
Prof. Ugo Luigi Aparo (Italie)
- 15:30-16:15**      **European COVID 19 Crisis: Hospital manager feedback - Part 2**  
Speakers: Mr. Alexandre Lourenço (Portugal) / Dr. Georgia  
Oikonomopoulou (Greece) / Dr. Lajos Ari (Hungary)
- 16:15-17:00**      **European COVID 19 Crisis: Hospital manager feedback - Part 3**  
Speakers: Mr. Gerry O'Dwyer (Ireland) / Mrs Louise McMahon (United  
Kingdom) / Dr. Páll Matthíasson (Iceland)