TERM OF REFERENCE (TOR) INTERNATIONAL VIRTUAL COURSE
SEA Crossing - Simulating human and animal migration through Insular SouthEast Asia by means of crossing ocean barriers

Geological Engineering Study Program
Faculty of Earth Sciences and Technology
Institut Teknologi Bandung
August 22nd September 16th 2022

Background

Located in the interface of two distinct continents of Asia and Australia, studies of biogeography have long focused on the Indonesian Archipelago as an intriguing and complex zone of faunal interchange. The fauna of the Indonesian archipelago has a particularly high level of biodiversity and endemism, notionally divided into three zoogeographical regions: Oriental/Asiatic in the west, Australasian in the east and Wallacea transitional region in between. The very distinct faunal characteristic is not only occurring in the Present day extant faunal distribution, but also in the fossil record. This complex faunal distribution occurs owing to the unstable and complicated geological history combined with fluctuates paleoclimate and paleo-oceanographic for the past millions of years. This condition brought up a question: how can we reconstruct such dispersal events, their timing, their population numbers and respective preconditions, causes and constraints? In this course, we will study the animals, including early hominin dispersal events and learn more about methods for reconstructions.

Human and animal fossils, their geographic distribution together with their age provide us with the framework of further studies. This dataset allows us to answer questions about the when, where, and who. Paleogenetic studies reveal links and exchange among early populations. But if we want to learn more about the dispersal processes proper, potential geographic routes and the preconditions under which dispersal took place, we need to reconstruct ecology and lifeways of hominin and faunal representatives. Lifeway and ecology have a large impact on mobility patterns of early hominins and other fauna, and thereby on dispersal on a larger scale.

In this class we will focus on barriers and corridors for dispersal and we will examine the possibilities

modelling. We designed ABMs to determine the capabilities and the success of hominins and other Pleistocene mammals to cross sea straits. We will have a look at the factors determining the capacities to cross sea straits, examine how they are implemented in the ABMs and design and run sets of experiments.

The course is acknowledged as 2-credits module GL-
Bachelor Degree students or GL-

Objectives

1. To overview the unique dispersal paleobiogeography of early humans and animals throughout Indonesian Archipelago
2. To overview the agent (human/animal) and environmental preconditions

3. To reconstruct the dispersal processes proper, potential geographic routes and success rate of ocean crossing.

Program Overview

The main top - Simulating human and animal

by lecture activities and practice. All modules are taught online via zoom meeting.
Lecture activities are held to deliver new insights and knowledge of Indonesian Archipelago paleontology, paleoenvironment, paleobiogeography and paleo-oceanography. All of these different topics will be integrated and applied into the SEA-Crossing computer model that will be taught during the practice.

Class Activity

Lectures	Participants attend classes where the lecturers deliver materials on specific topics, followed by discussion sessions.
Practice	Students will be guided by assistant to work on SEA-crossing model in groups. Each groups will work on different species and dispersal routes.
Final Presentation	The result of the practice will be compiled as a report/presentation that will be presented at the end of the course. At the later stage, the result will be proceed further into a publication (for each group), all participants who completed the course will be included in the publications as co-authors.

Organizing Committees

- Dr. Irwan Meilano (Executive Advisor)
- Dr. rer.nat. Mutiara R. Putri (Executive Advisor)
- Dr. Agus Mochamad Ramdan (Executive Advisor)
- Dr. rer. nat. Rima Rachmayani (Person in Charge)
- Mika R. Puspaningrum, PhD (Person in Charge)
- Iwan P. Anwar, M.Si., Maria Adelia Widijanto, S.Si., Naufal Nurmahdi, Herve Pierre Sidarta, Muhammad Anshari Matin (Research Assistant)
- Rizqi Valentra, S.T., Adam Librian, Salsabila (Secretary)
- Siti Tamalia Zuraydah, A.Md., An-Nur, Isma Wulandini (Department of Logistic and Network)

Speakers (in alphabetical order)

1. A. M. Surya Nugraha (Earth Observatory of Singapore)
2. Alexandra van der Geer (Naturalis Biodiversity Center, Leiden, Netherland)
3. Christine Hertler (ROCEEH, Senckenberg Research Institute and Natural History Museum, Germany)
4. Dian Rosleine (Biology, ITB, Indonesia)
5. Ericson Hölzchen (German Centre for Artificial Intelligence, Trier, Germany)
6. Gerrit D. van den Bergh (University of Wollongong)

7. Iwan Pramesti Anwar (Oceanography, ITB, Indonesia)
8. Jan - Olaf Reschke ((ROCEEH, Senckenberg Research Institute and Natural History Museum; Goethe University, Germany)
9. Julien Louys (Griffith University)
10. Mika Rizki Puspaningrum (Geological Engineering, ITB, Indonesia

Participants

The participants of this course consist of undergraduate and graduate students from various university around the world, also some professionals from Indonesia.

Program Timeline

This course will be held on 22 August 16 September 2022. Detailed timeline can be seen on the table below.

Week 1	Monday, 22 August 2022	15.00-15.30	Opening	Dean of FEST
		15.30-16.30	Overview of the program	Mika R. Puspaningrum
	Tuesday, 23 August 2022	15.00-16.30	Paleogeography of Sulawesi	A.M. Surya Nugraha (Earth Observatory of Singapore)
	Wednesday, 24 August 2022	15.00-16.30	Ecology ad faunal Dispersal in Indonesian Archipelago	Dian Rosleine (Biology, ITB, Indonesia)
	Thursday, 25 August 2022	15.00-16.30	Oceanography of Indonesian Archipelago	Iwan Pramesti Anwar (Oceanography, ITB, Indonesia)
	Friday, 26 August 2022	16.00-17.30	Dispersal and biogeography of insular elephants	Alexandra van der Geer (Naturalis Biodiversity Center, Leiden, Netherland)
Week 2	Monday, 29 August 2022	16.00-17.30	Swim, Shrink, and Disperse	Christine Hertler (ROCEEH, Senckenberg Research Institute and Natural History Museum, Germany)
	Wednesday, 31 August 2022	16.00-17.30	Swimming as a cultural achievement	Ericson Hölzchen (German Centre for Artificial Intelligence, Trier, Germany)
	Thursday, 1 September 2022	16.00-17.30	SEA Crossing Model	Jan - Olaf Reschke ((ROCEEH, Senckenberg Research Institute and Natural History Museum; Goethe University, Germany)
	Friday, 2 September 2022	15.00-16.30	Converging continents and sea-level fluctuations: key factors in Quaternary terrestrial fauna dispersals in to Wallacea	Gerrit D. van den Bergh (University of Wollongong)

		17.00-18.30	Megafaunal Extinction in Indo-Australia	Julien Louys (Griffith University)
Week 3	Monday, 5 September 2022	15.00-16.30	Pract 1: Getting used with Netlogo program	
	Tuesday, 6 September 2022	15.00-16.30	Pract 2: Determining agent properties and crossing routes	
	Wednesday, 7 September 2022	15.00-16.30	Pract 3: Reconstruction environment (sea straits properties, sea level, and seasonal migration)	
	Thursday, 8 September 2022	15.00-16.30	Pract 4: Combining agent properties and environment, running experiments	
	Friday, 9 September 2022	15.00-16.30	Pract 5: Sensitivity studies and replication assesment	
Week 4	Monday, 12 September 2022	15.00-16.30	Independent work with assistant, Preparing group report and presentation	
	Tuesday, 13 September 2022	15.00-16.30	Independent work with assistant, Preparing group report and presentation	
	Wednesday, 14 September 2022	15.00-17.00	Group Presentation	
	Thursday, 15 September 2022	15.00-16.30	Paleobiogeography	Laurent Husson (ISTTerre)
		16.00-17.00	Closing	PIC

Standard Operating Procedure (SOP)

General:

- The course will be held on Zoom
- Participants are expected to comply with the SOP

Course SOP:

1. All lecturers must deliver the course with the camera open, using the designated virtual background.
2. Participants use username on the zoom meeting under the format: **[Institution/ University] (Space) Full Name**
3.
4. QnA session will be held after the lecture through Zoom chat box or directly by unmuting the microphone. The QnA session is conducted by the moderator.
5. If breakout room are available, please join - session, please join breakout rooms according to your assigned groups.

1.
   - Moderator officially opens the course session.
2.
   - Moderator introduces
3.
   - The lecturer delivers the topic for about 45-60 minutes.
4. **QnA session (15-**
   - Each course will only have one QnA session guided by the moderator.
5. **Closing session**
   - Moderator arranges photo session before closing the session.

Course Completion
To complete the program, participants need to attend the entire courses (lectures and practice sessions), and presenting their group project. Participants that completed the program will be awarded a certificate

to index for credit transfer purposes, additional payment is required (please refer to https://admission.itb.ac.id/registration/nonreguler/ivc).

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