



# EXAMPLES FROM THE AUDIENCE

Practical Deep-Dive on ChatGPT

28 June 2023

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*Richard de Grijs*

My example relates to historical research of convict records from the early days of the Australian colony of New South Wales. I approached my research in the usual way, with a deep and broad dive into the subject matter both online (Google, online databases, online family records, etc.) and in a range of archives (State Library of New South Wales, State Archives and Records of New South Wales, National Library of Australia, etc.) Having done my due diligence, this seemed like a good opportunity to also check whether ChatGPT might be a useful research aid. I figured that although ChatGPT is a 'large language model', its access to vast amounts of information and its AI-like linking prowess might potentially be harnessed to turn it into a scholarly discovery aid.

Initially, ChatGPT threw up some new information I hadn't encountered yet, so I persisted in following up to the point where I would have verifiable references. This led down several rabbit holes and 'hallucinations', eventually crashing into a dead end at the State Archives. I published the story of my research on The Scholarly Kitchen:

<https://scholarlykitchen.sspnet.org/2023/04/27/guest-post-artificial-intelligence-not-yet-intelligent-enough-to-be-a-trusted-research-aid/>

# PROGRAMMING WITH GITHUB COPILOT

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*Mario Gaimann, M.Sc.*

## What is **GitHub Copilot**

Cloud-based AI tool by GitHub and OpenAI (Microsoft)

- AI-Powered Code Suggestions
- Context-Aware Autocompletion
- Rapid Code Generation
- Multiple Programming Language Support
- Learning from the Community

? More information: <https://github.com/features/copilot>

# PROGRAMMING WITH GITHUB COPILOT

Mario Gaimann, M.Sc.

## 1. Composing Functions I

```
float add_two_numbers(float a, float b) {  
    return a + b;  
}
```

- Type the name of the desired function (add\_two\_numbers)
- Github Copilot suggests how to compose this function (in grey)

## 2. Composing Functions II

```
// function that adds two floats  
float_type add(float_type a, float_type b) {  
    return a + b;  
}
```

- Write a comment about a function that you would like to have (here: first line with //)
- Github Copilot suggests how to compose the complete function (in grey)

## 3. Avoiding Repetitions

```
/*!  
 * @brief Integrate the positions and velocities of a driven Lyburn population.  
 * @param population Driven Lyburn population to be integrated.  
 */  
inline void operator()(LyburnPopulation &population) override {  
    this->operator()(static_cast<ForcePopulation>&(population));  
    this->operator()(static_cast<DrivenPopulation>&(population));  
};  
/*!  
 * @brief Integrate the positions and velocities of a driven binary mixture population.  
 * @param population Driven binary mixture population to be integrated.  
 */
```

- You wrote an existing function for one case (colored lines, “Lyburn population”)
- GitHub Copilot suggests new code that expands the present code to other cases that might need to be addressed in the code (grey lines, “binary mixture population”)

# PROGRAMMING WITH GITHUB COPILOT

Mario Gaimann, M.Sc.

## 4. Discover Better Coding Styles

```
void EulerIntegrator::integratePositions(VicsekPopulation &population) {  
    // x  
    std::transform(population.x.begin(), population.x.end(),  
                  population.v_x.begin(), population.x.begin(),  
                  [this](float_type x, float_type v) { return this->integrationFunctor(this->integrationTimeStep, x, v); });  
}
```

- Github Copilot can show you new functionalities of a programming language that you might not be familiar with (here: `std::transform` function in grey)

## 5. Documentation

```
/*!  
 * @brief Integrate the positions and velocities of a driven binary mixture population.  
 * @param population Driven binary mixture population to be integrated.  
 */  
inline void operator()(DrivenBinaryMixturePopulation &population) override {  
    this->operator()(static_cast<VicsekPopulation&>(population));  
    this->operator()(static_cast<DrivenPopulation&>(population));  
}
```

- Write a function (last four green lines)
- Type the symbols to begin a documentation (“docstring”) (here: first line, green `/*!`)
- Github Copilot reads the function and generates a description (“documentation”) of how to use this function (grey lines beginning with `*`)

# PROGRAMMING WITH GITHUB COPILOT

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*Mario Gaimann, M.Sc.*

## Summary

GitHub Copilot helps me to

- ...reduce repetitive coding tasks
- ...write simple functions from scratch
- ...learn about new coding styles
- ...easily document the code

## Advantages

- Increased productivity
- Improved code quality
- Learning aid
- Versatile language support
- Collective knowledge and best practices

## Disadvantages

- Over-reliance on AI suggestions
- Inaccurate or suboptimal suggestions
- Intellectual property concerns
- Security and privacy considerations
- Limited offline functionality

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## Contact

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*Noorali Jiwaji*

Finding an explanation about a science concept that gives sufficient information suitable for different levels of audience.

I have found that each time ChatGTP gives different angles of information when the same question is queried several times and omits/adds new information each time

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*Francis Dakyaga*

A colleague introduced it to me as software, that can assist in writing. He showed me how to do the prompts. I sat down and tried it with him by requesting for a review of the literature on a given topic, of my research area of expertise. The intention was for me to judge its efficacy. But to my dismay, it was not accurate enough. It produced the review, and in-text citations with several references/books or articles that do not exist in google scholar and can't be traced either. From there, I lost hope of its efficacy for scientific work, as the language/write-ups it produces did not resonate with my own voice. It may assist in setting the pace, but can't do complete good scientific writing in my view.

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*Barbara Nowak*

Student used ChatGPT to write an assignment, it was obvious as references were made up (but looked quite real) and they were other mistakes which shouldn't have happened.

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*gabriella verbovszky*

Personally, I have not tried ChatGPT but I recently gave a presentation and can share a few examples of what the Godfather of AI says (Yoshua Bengio):

<https://www.bbc.com/news/technology-65760449>

[https://www.democracynow.org/2023/6/1/ai\\_bengio\\_petty\\_tegmark](https://www.democracynow.org/2023/6/1/ai_bengio_petty_tegmark)

<https://www.safe.ai/statement-on-ai-risk>



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*PHAM NGOC BAO*

As a non-native English speaker and a senior researcher, I find ChatGPT quite helpful and helps me a lot in daily work activities, such as:

1. Professional English proofreading and improving my writing
2. Helping to find the latest research papers and articles on specific topics
3. Helping to summarize reports or papers to capture critical points/findings from the papers or reports
4. Facilitate conducting a literature review (in combination with other AI-based programs such as Elicit)
5. Assisting in gaining a better understanding of new concepts or issues
6. Assisting in gaining a better understanding and interpreting data
7. Helping to write quick response emails
8. Suggesting a structured outline for a short report
9. Brainstorming new ideas
10. Helping to prepare materials for public outreach

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*Auke Slotegraaf*

I was/am hesitant to share, because it is an idea for potential use and not an actual use case. So feel free to ignore!

The idea is to use ChatGPT to inspire/create modern star lore, coming up with suggestions for what may be the "ethnoastronomy of the 22nd century".

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*DR (MRS) IFEOMA OFURUM*

I got to know about ChatGPT in a workshop I attended 2 months ago and since then it's been revolutionary for me. I work where I may have to give talks or be part of a discussion panellist regarding a particular topic with short notice. Such tasks do not look cumbersome anymore because I know I have the ChatGPT to give me some clues when I give it suitable prompts. When I had to prepare for a recent interview, I consulted ChatGPT to give me cues on what to prepare for in my area of specialization and it did. I consult the app for practically everything that has to do with writing. It is a wonderful help mate!

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*George Clifford Yamson*

chatGPT gives me an imaginary citation and references which are not found on Google scholar.

I wish to have an opportunity to present a paper I have written related to my field pointing out the flaws.

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*Suleiman Abubakar Garba*

I am using ChatGPT to generate research questions

I used ChatGPT to search for medicinal plants liable for further investigation

I used ChatGPT to generate article structure

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*John Chrysostom Opedun*

### Writing a scientific summary

With ChatGPT I can be able to have a summary of scientific concepts out of a broader view/topic. When I am reading an article for example, I can be able to have a quick summary of materials used, methods, introduction or general overview and try to compare this with my own personal summary and in many cases I find a synergic relationship where ChatGPT can help me identify missing points.

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*Karuna Rameshkumar*

In the laboratory, when a complete blood count is requested, differential count of White blood cells has to be done. As part of that, as a research project, we were feeding AI to differentiate between Neutrophils, Lymphocytes, Monocytes, Eosinophils and Basophils. Except Eosinophils, all the rest were identified properly. The parameters to identify were size, nuclear structure, cytoplasm and the cytoplasmic granules. As both neutrophils and eosinophils have cytoplasmic granules, the eosinophils were clubbed with neutrophils. The color of the granules in eosinophils is orange. Probably because of the difference in color, which we did not include in the feed such mistake happened. Later when we added the color also, it took more time to identify. So the reporting time became little more. When we discussed this with clinicians, they were happy about the correctness in reporting rather than a delay of few minutes. When we teach medical students about the differential count, they identify the cell looking at the morphology of the cell. The lessons we learnt were to feed maximum parameters and maximum data points to get correct results.

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*Usha Harris*

To acquaint myself with this technology I carried out a little experiment. I decided to pose a question about research I know something about, participatory environmental communication, a term I have used in my book “Participatory Media in Environmental Communication” (Routledge, 2019). So I asked ChatGPT ‘What is participatory environmental communication and name one scholar who has developed this approach.’ The answer to the first question was broadly acceptable using appropriate key terms, but the answer to the second question rang alarm bells.

ChatGPT: “One of the scholars who contributed to the development of participatory environmental communication is Prof. Stephen B. Cropper. He is a Professor Emeritus in the School of Journalism and Mass Communication at the University of North Carolina at Chapel Hill, and has conducted extensive research on environmental communication and participatory approaches. He is the author of several books and articles on the topic, including "Environmental Communication and the Public Sphere" is by "Environmental Communication and the Extinction Vortex" and "Communication and Public Participation in Environmental Decision Making".”

To verify this information, I did a rudimentary Google search. This information is not correct. I can’t find a Prof Stephen B. Cropper who worked in this area. [There is a Stephen Cropper, Professor of Management who has worked in health and community engagement in the UK.] The titles that ChatGPT assigns to Cropper are not his but other scholars as listed here: "Environmental Communication and the Public Sphere" is by Phaedra C. Pezzullo - University of Colorado, Boulder, USA, Robert Cox - The University of North Carolina at Chapel Hill, USA. "Environmental Communication and the Extinction Vortex" is by Eric Kramer, Gabriel Adkins, Sang Ho Kim, Greg Miller. "Communication and Public Participation in Environmental Decision Making" is edited by Stephen P. Depoe, John W. Delicath, and Marie-France Aepli Elsenbeer.

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*Usha Harris*

What was most alarming was ChatGPT's ability to generate this information using definitive language that had no hint of doubt or warning, such as 'this information needs verification'.

After a series of questions, I asked, 'Do you have any information on (my name) on participatory media in environmental communication?'. It didn't. Okay, so I have around 280 citations on Google scholar, maybe not enough. Once I gave ChatGPT the title of my book, it came back with more information including this:

"In this book, Harris explores the potential of participatory media to promote environmental communication and engagement among communities in the periphery.[total rehash of the title] She draws on case studies from India, where she has conducted extensive fieldwork, to demonstrate how participatory media can facilitate community-based approaches to environmental management and communication."

Wrong. I have not conducted extensive research in India. In fact, none whatsoever. My research is based in the Pacific Islands. But because my name is of Indian origin it assumed I had done so. When I asked it to search for other citations of my work it confidently brought out a list of seven. Only one was correct (my book title). All others were total fabrications, but sounded so plausible. This weakness of ChatGPT has been discussed in forums.

What these answers demonstrate is that ChatGPT has a bias towards citing Anglo male academics from the northern hemisphere and make cultural assumptions based on names.

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*Rotem Zelingher*

When trying to produce R code in ChatGpt, it *\*always\** returns errors that I don't get to solve. It is as if it produces R codes that do not make any sense.

When writting the returned error, it writes "I appologize....." and gives another non-sense code. It always make mistakes with R codes.

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*Himansu Sekhar Fatesingh*

Just asked few questions about different issues and got the the answers.

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*Luz Garcia*

Create and debug codes in python

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*Hira Fatima*

I use ChatGPT to ensure the accuracy of the English in my written emails and reports.

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*Liantsoa Finaritra Randrianjanahary*

Use of chatGPT for postgraduate research in Astronomy

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*Linda Dari*


Most references are incorrect and need to be cross referenced.


# THANK YOU


We look forward to the next steps.

For any questions, email me at

Insert your email address here

 [company/international-science-council](https://www.linkedin.com/company/international-science-council)

 [InternationalScienceCouncil](https://www.youtube.com/InternationalScienceCouncil)

 [InternationalScience](https://www.facebook.com/InternationalScience)

 [council.science](https://www.instagram.com/council.science)

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