# Article information:

Robust adaptive neural network control for dynamic positioning of marine vessels with prescribed performance under model uncertainties and input saturation - ScienceDirect  
<https://www.sciencedirect.com/science/article/pii/S092523122101571X>

# Article summary:

1. Dynamic positioning (DP) systems are increasingly important for marine vessels in deep waters, and controller design for DP systems has been a focus of research since the 1960s.

2. Linear control methods are difficult to apply to DP systems due to their high nonlinear characteristics, leading researchers to explore nonlinear control techniques such as vectorial backstepping control, sliding mode control, fuzzy logic control, and neural network (NN) control.

3. To achieve stable control under external disturbances, researchers have developed robust output feedback control laws based on vectorial backstepping methods, adaptive NNs to compensate for unknown dynamics and disturbances, and finite-time observers to eliminate adverse effects caused by unknown disturbances and achieve cooperative control of multiple DP vessels with constrained control efforts.

# Article rating:

Appears moderately imbalanced: The article provides some useful information, but is missing several important points or pieces of evidence that would be required to present the discussed topics in a balanced and reliable way. You are encouraged to seek a more balanced perspective on the presented issues by exploring the provided research topics and looking at different information sources.

# Article analysis:

作为一篇关于动态定位系统控制器设计的科技论文，该文章在介绍了动态定位系统的背景和发展历程后，详细讨论了线性和非线性控制方法，并提出了鲁棒自适应神经网络控制方法。然而，在阅读该文章时，我们也可以发现一些潜在的偏见和问题。

首先，文章中强调了海洋资源开发的重要性，并将单个智能海洋设备或网络化海洋系统与此联系起来。然而，这种观点可能会忽略对海洋生态环境的影响和保护问题。此外，文章没有提到如何平衡开发和保护之间的关系。

其次，在介绍动态定位系统控制器设计的历史时，文章只提到了线性控制方法需要一个线性模型，并认为非线性特征使得这些方法难以实现理想结果。然而，这种说法可能过于简单化，并没有考虑到一些新兴的非线性控制方法。

此外，在介绍鲁棒自适应神经网络控制方法时，文章并没有提供足够的证据来支持其有效性。虽然作者提到了其他研究者使用类似方法进行DP系统控制器设计并取得了成功，但并没有提供具体的案例或实验结果来证明该方法的优越性。

最后，在文章中并没有探讨可能存在的风险和挑战。例如，DP系统在海洋环境中面临着复杂多变的气象和海洋条件，这可能会对控制器设计和系统稳定性产生影响。此外，文章也没有平等地呈现双方观点，并可能存在一些偏袒某种控制方法或技术的倾向。

综上所述，虽然该文章提供了有关动态定位系统控制器设计的详细介绍和讨论，但也存在一些潜在的偏见和问题。因此，在阅读该文章时需要保持批判性思维，并结合其他相关研究进行深入分析。

# Topics for further research:

* Environmental impact of ocean resource development
* Emerging nonlinear control methods
* Evidence supporting the effectiveness of robust adaptive neural network control
* Risks and challenges of DP systems in marine environments
* Balanced presentation of different control methods and technologies
* Critical analysis and integration of related research

# Report location:

<https://www.fullpicture.app/item/7e0c0ba6677ea1d8a87d403d155bbc26>