

[Home](#) > [Journal of the Brazilian Society of Mechanical Sciences and Engineering](#) > [Article](#)

Developing of ANN model for prediction of performance and emission characteristics of VCR engine with orange oil biodiesel blends

Technical Paper | Published: 29 March 2017

Volume 39, pages 2877–2888, (2017) [Cite this article](#)

Your privacy, your choice

We use essential cookies to make sure the site can function. We, and our 96 **partners**, also use optional cookies and similar technologies for advertising, personalisation of content, usage analysis, and social media.

By accepting optional cookies, you consent to allowing us and our partners to store and access personal data on your device, such as browsing behaviour and unique identifiers. Some third parties are outside of the European Economic Area, with varying standards of data protection. See our **privacy policy** for more information on the use of your personal data. Your consent choices apply to springer.com and applicable subdomains.

You can find further information, and change your preferences via 'Manage preferences'. You can also change your preferences or withdraw consent at any time via 'Your privacy choices', found in the footer of every page.

We use cookies and similar technologies for the following purposes:



- > **Store and/or access information on a device**
- > **Personalised advertising and content, advertising and content measurement, audience research and services development**

[Accept all cookies](#)

[Reject optional cookies](#)

[Manage preferences](#)

functions were investigated. Levenberg–Marquardt (trainlm) with log and tan sigmoidal transfer function provided the best results amongst the other six training algorithms. It was found to be an accurate predicting model for analyzing the performance and emission characteristics VCR engine with biodiesel blends. In all compression ratios, 20 OME showed better thermal efficiency and reduced fuel consumption than diesel. Lower CO and HC emissions were observed with 20 OME than diesel except NO_x.

 This is a preview of subscription content, [log in via an institution](#)  to check access.

Access this article

Your privacy, your choice

We use essential cookies to make sure the site can function. We, and our 96 **partners**, also use optional cookies and similar technologies for advertising, personalisation of content, usage analysis, and social media.

By accepting optional cookies, you consent to allowing us and our partners to store and access personal data on your device, such as browsing behaviour and unique identifiers. Some third parties are outside of the European Economic Area, with varying standards of data protection. See our **privacy policy** for more information on the use of your personal data. Your consent choices apply to springer.com and applicable subdomains.

You can find further information, and change your preferences via 'Manage preferences'. You can also change your preferences or withdraw consent at any time via 'Your privacy choices', found in the footer of every page.

We use cookies and similar technologies for the following purposes:

Store and/or access information on a device

Personalised advertising and content, advertising and content measurement, audience research and services development

Accept all cookies

Reject optional cookies

Manage preferences

Similar content being viewed by others



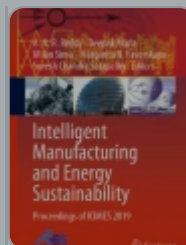
[ANN modeling for forecasting of VCR engine performance and emission parameters fuelled with green diesel...](#)

Article | 10 March 2022



[Forecasting of an ANN model for predicting behaviour of diesel engine energised by a combination of two low...](#)

Article | 05 September 2019



[Prediction of the WPP0 Biodiesel-Fuelled HCCI Engine Using Artificial Neural Networks](#)

Chapter | © 2020

Abbreviations

Your privacy, your choice

We use essential cookies to make sure the site can function. We, and our 96 **partners**, also use optional cookies and similar technologies for advertising, personalisation of content, usage analysis, and social media.

By accepting optional cookies, you consent to allowing us and our partners to store and access personal data on your device, such as browsing behaviour and unique identifiers. Some third parties are outside of the European Economic Area, with varying standards of data protection. See our **privacy policy** for more information on the use of your personal data. Your consent choices apply to springer.com and applicable subdomains.

You can find further information, and change your preferences via 'Manage preferences'. You can also change your preferences or withdraw consent at any time via 'Your privacy choices', found in the footer of every page.

We use cookies and similar technologies for the following purposes:

Store and/or access information on a device

Personalised advertising and content, advertising and content measurement, audience research and services development

[Accept all cookies](#)

[Reject optional cookies](#)

[Manage preferences](#)

References

1. Karthickeyan V, Balamurugan P, Senthil R (2016) Studies on orange oil methyl ester in diesel engine with hemispherical and toroidal combustion chamber. Therm Sci 20:981–989. doi:[10.2298/TSCI16S4981K](https://doi.org/10.2298/TSCI16S4981K)

[Article](#) [Google Scholar](#)

2. Karthickeyan V, Balamurugan P, Senthil R (2016) Production of orange oil methyl ester and experimental investigation on thermal barrier coated diesel engine. Asian J Res Soc Sci Humanit 6:156–178. doi:[10.5958/2249-7315.2016.00601.8](https://doi.org/10.5958/2249-7315.2016.00601.8)

[Google Scholar](#)

Your privacy, your choice

We use essential cookies to make sure the site can function. We, and our 96 **partners**, also use optional cookies and similar technologies for advertising, personalisation of content, usage analysis, and social media.

By accepting optional cookies, you consent to allowing us and our partners to store and access personal data on your device, such as browsing behaviour and unique identifiers. Some third parties are outside of the European Economic Area, with varying standards of data protection. See our **privacy policy** for more information on the use of your personal data. Your consent choices apply to springer.com and applicable subdomains.

You can find further information, and change your preferences via 'Manage preferences'. You can also change your preferences or withdraw consent at any time via 'Your privacy choices', found in the footer of every page.

We use cookies and similar technologies for the following purposes:

Store and/or access information on a device

Personalised advertising and content, advertising and content measurement, audience research and services development

[Accept all cookies](#)

[Reject optional cookies](#)

[Manage preferences](#)

7. Naik SN, Goud VV, Rout PK, Dalai AK (2010) Production of first and second generation biofuels: a comprehensive review. *Renew Sustain Energy Rev* 14:578–597. doi:[10.1016/j.rser.2009.10.003](https://doi.org/10.1016/j.rser.2009.10.003)

[Article](#) [Google Scholar](#)

8. Atadashi IM, Aroua MK, Aziz AA (2011) Biodiesel separation and purification: a review. *Renew Energy* 36:437–443. doi:[10.1016/j.renene.2010.07.019](https://doi.org/10.1016/j.renene.2010.07.019)

[Article](#) [Google Scholar](#)

9. Najjar YSH, Amer MMB (2016) Using a smart device and neuro-fuzzy control

Your privacy, your choice

We use essential cookies to make sure the site can function. We, and our 96 **partners**, also use optional cookies and similar technologies for advertising, personalisation of content, usage analysis, and social media.

By accepting optional cookies, you consent to allowing us and our partners to store and access personal data on your device, such as browsing behaviour and unique identifiers. Some third parties are outside of the European Economic Area, with varying standards of data protection. See our **privacy policy** for more information on the use of your personal data. Your consent choices apply to springer.com and applicable subdomains.

You can find further information, and change your preferences via 'Manage preferences'. You can also change your preferences or withdraw consent at any time via 'Your privacy choices', found in the footer of every page.

We use cookies and similar technologies for the following purposes:

Store and/or access information on a device

Personalised advertising and content, advertising and content measurement, audience research and services development

[Accept all cookies](#)

[Reject optional cookies](#)

[Manage preferences](#)

[Article](#) [Google Scholar](#)

13. Purushothaman K, Nagarajan G (2009) Effect of injection pressure on heat release rate and emissions in CI engine using orange skin powder diesel solution. Energy Convers Manag 50:962–969. doi:[10.1016/j.enconman.2008.12.030](https://doi.org/10.1016/j.enconman.2008.12.030)

[Article](#) [Google Scholar](#)

14. Tüccar G, Tosun E, Özgür T, Aydin K (2014) Diesel engine emissions and performance from blends of *Citrus sinensis* biodiesel and diesel fuel. Fuel 132:7–11. doi:[10.1016/j.fuel.2014.04.065](https://doi.org/10.1016/j.fuel.2014.04.065)

Your privacy, your choice

We use essential cookies to make sure the site can function. We, and our 96 **partners**, also use optional cookies and similar technologies for advertising, personalisation of content, usage analysis, and social media.

By accepting optional cookies, you consent to allowing us and our partners to store and access personal data on your device, such as browsing behaviour and unique identifiers. Some third parties are outside of the European Economic Area, with varying standards of data protection. See our **privacy policy** for more information on the use of your personal data. Your consent choices apply to springer.com and applicable subdomains.

You can find further information, and change your preferences via 'Manage preferences'. You can also change your preferences or withdraw consent at any time via 'Your privacy choices', found in the footer of every page.

We use cookies and similar technologies for the following purposes:

Store and/or access information on a device

Personalised advertising and content, advertising and content measurement, audience research and services development

[Accept all cookies](#)

[Reject optional cookies](#)

[Manage preferences](#)

fueled diesel engine with Jatropha Methyl Ester biodiesel blends. J Nat Gas Sci Eng 26:549–557. doi:[10.1016/j.jngse.2015.06.041](https://doi.org/10.1016/j.jngse.2015.06.041)

[Article](#) [Google Scholar](#)

18. Roy S, Banerjee R, Das AK, Bose PK (2014) Development of an ANN based system identification tool to estimate the performance-emission characteristics of a CRDI assisted CNG dual fuel diesel engine. J Nat Gas Sci Eng 21:147–158. doi:[10.1016/j.jngse.2014.08.002](https://doi.org/10.1016/j.jngse.2014.08.002)

[Article](#) [Google Scholar](#)

19. Parlak A, Islamoglu Y, Yasar H, Egrisogut A (2006) Application of artificial neural network to predict specific fuel consumption and exhaust temperature for a diesel engine. Appl Therm Eng 26:824–828

Your privacy, your choice

We use essential cookies to make sure the site can function. We, and our 96 **partners**, also use optional cookies and similar technologies for advertising, personalisation of content, usage analysis, and social media.

By accepting optional cookies, you consent to allowing us and our partners to store and access personal data on your device, such as browsing behaviour and unique identifiers. Some third parties are outside of the European Economic Area, with varying standards of data protection. See our **privacy policy** for more information on the use of your personal data. Your consent choices apply to springer.com and applicable subdomains.

You can find further information, and change your preferences via 'Manage preferences'. You can also change your preferences or withdraw consent at any time via 'Your privacy choices', found in the footer of every page.

We use cookies and similar technologies for the following purposes:

Store and/or access information on a device

Personalised advertising and content, advertising and content measurement, audience research and services development

[Accept all cookies](#)

[Reject optional cookies](#)

[Manage preferences](#)

23. Pai PS, Rao BPS (2011) Artificial neural network based prediction of performance and emission characteristics of a variable compression ratio CI engine using WCO as a biodiesel at different injection timings. Appl Energy 88:2344-2354. doi:[10.1016/j.apenergy.2010.12.030](https://doi.org/10.1016/j.apenergy.2010.12.030)

[Article](#) [Google Scholar](#)

24. Yusaf TF, Buttsworth DR, Saleh KH, Yousif BF (2010) CNG-diesel engine performance and exhaust emission analysis with the aid of artificial neural network. Appl Energy 87:1661-1669. doi:[10.1016/j.apenergy.2009.10.009](https://doi.org/10.1016/j.apenergy.2009.10.009)

[Article](#) [Google Scholar](#)

Your privacy, your choice

We use essential cookies to make sure the site can function. We, and our 96 **partners**, also use optional cookies and similar technologies for advertising, personalisation of content, usage analysis, and social media.

By accepting optional cookies, you consent to allowing us and our partners to store and access personal data on your device, such as browsing behaviour and unique identifiers. Some third parties are outside of the European Economic Area, with varying standards of data protection. See our **privacy policy** for more information on the use of your personal data. Your consent choices apply to springer.com and applicable subdomains.

You can find further information, and change your preferences via 'Manage preferences'. You can also change your preferences or withdraw consent at any time via 'Your privacy choices', found in the footer of every page.

We use cookies and similar technologies for the following purposes:

Store and/or access information on a device

Personalised advertising and content, advertising and content measurement, audience research and services development

[Accept all cookies](#)

[Reject optional cookies](#)

[Manage preferences](#)

29. Taghavifar H, Taghavifar H, Mardani A et al (2015) A numerical investigation on the wall heat flux in a di diesel engine fueled with *n*-heptane using a coupled CFD and ANN approach. Fuel 140:227–236.
doi:[10.1016/j.fuel.2014.09.092](https://doi.org/10.1016/j.fuel.2014.09.092)

[Article](#) [Google Scholar](#)

30. Ismail HM, Ng HK, Queck CW, Gan S (2012) Artificial neural networks modelling of engine-out responses for a light-duty diesel engine fuelled with biodiesel blends. Appl Energy 92:769–777.
doi:[10.1016/j.apenergy.2011.08.027](https://doi.org/10.1016/j.apenergy.2011.08.027)

Your privacy, your choice

We use essential cookies to make sure the site can function. We, and our 96 **partners**, also use optional cookies and similar technologies for advertising, personalisation of content, usage analysis, and social media.

By accepting optional cookies, you consent to allowing us and our partners to store and access personal data on your device, such as browsing behaviour and unique identifiers. Some third parties are outside of the European Economic Area, with varying standards of data protection. See our **privacy policy** for more information on the use of your personal data. Your consent choices apply to springer.com and applicable subdomains.

You can find further information, and change your preferences via 'Manage preferences'. You can also change your preferences or withdraw consent at any time via 'Your privacy choices', found in the footer of every page.

We use cookies and similar technologies for the following purposes:

Store and/or access information on a device

Personalised advertising and content, advertising and content measurement, audience research and services development

[Accept all cookies](#)

[Reject optional cookies](#)

[Manage preferences](#)

Corresponding author

Correspondence to [P. Balamurugan](#).

Additional information

Technical Editor: Luis Fernando Figueira da Silva.

Electronic supplementary material

Your privacy, your choice

We use essential cookies to make sure the site can function. We, and our 96 **partners**, also use optional cookies and similar technologies for advertising, personalisation of content, usage analysis, and social media.

By accepting optional cookies, you consent to allowing us and our partners to store and access personal data on your device, such as browsing behaviour and unique identifiers. Some third parties are outside of the European Economic Area, with varying standards of data protection. See our **privacy policy** for more information on the use of your personal data. Your consent choices apply to springer.com and applicable subdomains.

You can find further information, and change your preferences via 'Manage preferences'. You can also change your preferences or withdraw consent at any time via 'Your privacy choices', found in the footer of every page.

We use cookies and similar technologies for the following purposes:

Store and/or access information on a device

Personalised advertising and content, advertising and content measurement, audience research and services development

[Accept all cookies](#)

[Reject optional cookies](#)

[Manage preferences](#)

Issue Date

July 2017

DOI

<https://doi.org/10.1007/s40430-017-0768-y>

Keywords

[ANN prediction model](#)[Orange oil methyl ester](#)[Variable compression ratio](#)[Diesel engine](#)

Your privacy, your choice

We use essential cookies to make sure the site can function. We, and our 96 [partners](#), also use optional cookies and similar technologies for advertising, personalisation of content, usage analysis, and social media.

By accepting optional cookies, you consent to allowing us and our partners to store and access personal data on your device, such as browsing behaviour and unique identifiers. Some third parties are outside of the European Economic Area, with varying standards of data protection. See our [privacy policy](#) for more information on the use of your personal data. Your consent choices apply to springer.com and applicable subdomains.

You can find further information, and change your preferences via 'Manage preferences'. You can also change your preferences or withdraw consent at any time via 'Your privacy choices', found in the footer of every page.

We use cookies and similar technologies for the following purposes:

Store and/or access information on a device

Personalised advertising and content, advertising and content measurement, audience research and services development

[Accept all cookies](#)

[Reject optional cookies](#)

[Manage preferences](#)

Your privacy, your choice

We use essential cookies to make sure the site can function. We, and our 96 [partners](#), also use optional cookies and similar technologies for advertising, personalisation of content, usage analysis, and social media.

By accepting optional cookies, you consent to allowing us and our partners to store and access personal data on your device, such as browsing behaviour and unique identifiers. Some third parties are outside of the European Economic Area, with varying standards of data protection. See our [privacy policy](#) for more information on the use of your personal data. Your consent choices apply to springer.com and applicable subdomains.

You can find further information, and change your preferences via 'Manage preferences'. You can also change your preferences or withdraw consent at any time via 'Your privacy choices', found in the footer of every page.

We use cookies and similar technologies for the following purposes:

Store and/or access information on a device

Personalised advertising and content, advertising and content measurement, audience research and services development

[Accept all cookies](#)

[Reject optional cookies](#)

[Manage preferences](#)