



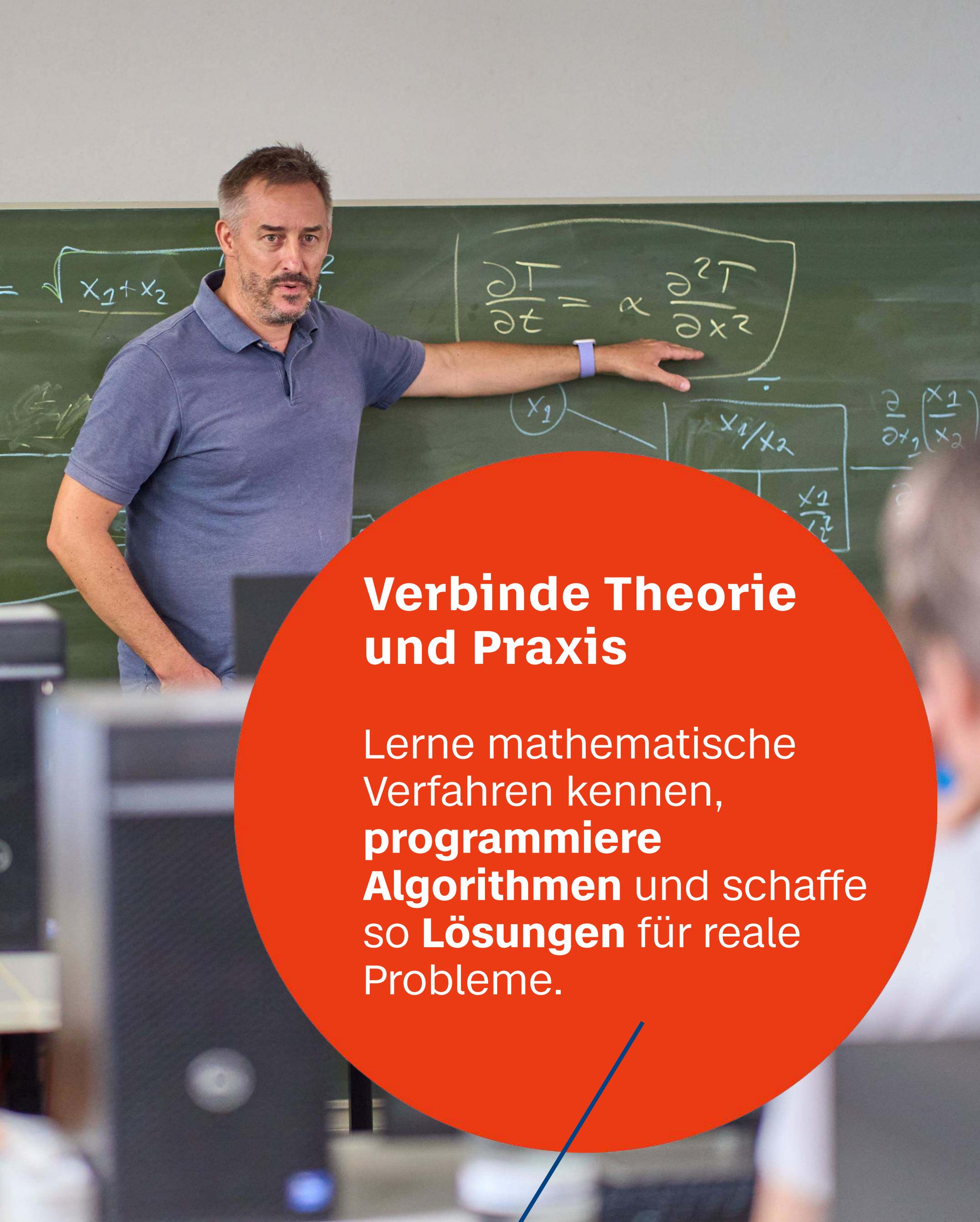
**Du willst die  
technische Welt  
verstehen und  
Probleme lösen?**

Swipe für mehr!



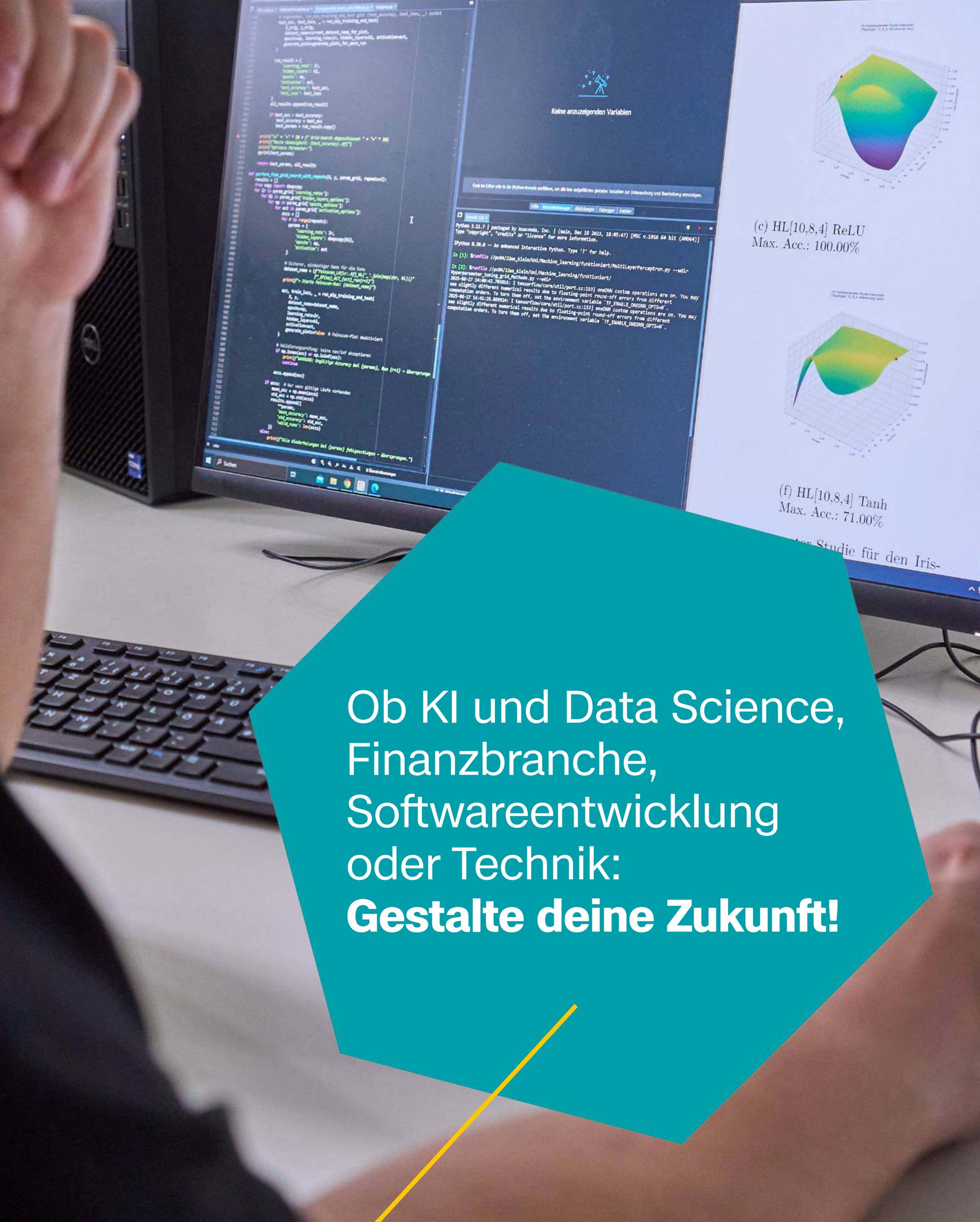
A man is seen in profile, focused on his work at a computer. The monitor displays a 3D CAD software interface with a wireframe model of a mechanical part. The software's menu bar includes 'Werkzeuge', 'Analysieren', 'Rendern', 'Panels', and 'Hilfe'. Below the menu, there are toolbars for 'Sichtbarkeit', 'Transformieren', 'Kurven', 'Flächen', 'Volumenkörper', and 'Polysurfaces'. The main workspace shows a perspective view of a complex, rounded mechanical component with various features like a dome and a protrusion. The interface also includes a 'Rechts' panel and a bottom toolbar with options like 'Rasterfang', 'Ortho', 'Planar', 'Ofang', 'SmartTrack', and 'Grenzf'.

Studiere  
**Angewandte  
Mathematik**  
an der Berliner  
Hochschule für  
Technik!



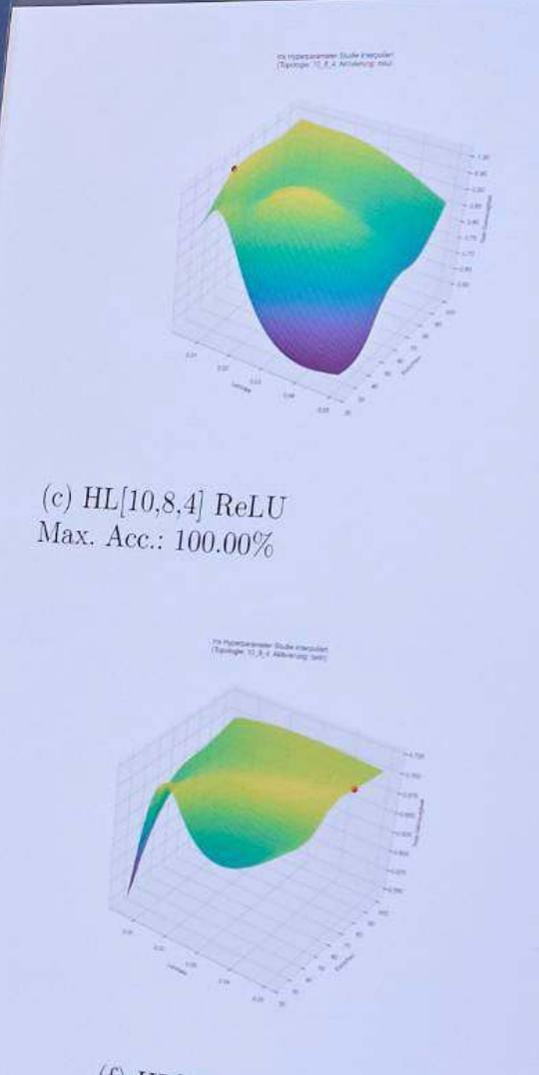
## Verbinde Theorie und Praxis

Lerne mathematische  
Verfahren kennen,  
**programmiere  
Algorithmen** und schaffe  
so **Lösungen** für reale  
Probleme.



```
def train_neural_network(X_train, y_train, X_test, y_test, n_hidden):  
    # Hyperparameter-Tuning  
    # Grid Search über die Anzahl der versteckten Neuronen  
    # und die Anzahl der Epochen  
    # Bestimme die besten Hyperparameter  
    best_acc = 0  
    best_hidden = 0  
    best_epochs = 0  
    for hidden in range(1, 100):  
        for epochs in range(1, 100):  
            # Trainiere das Modell mit den besten Hyperparametern  
            model = MLPClassifier(hidden_layer_sizes=(n_hidden, n_hidden, n_hidden),  
                                 max_iter=epochs, random_state=0)  
            model.fit(X_train, y_train)  
            acc = model.score(X_test, y_test)  
            # Aktualisiere die besten Hyperparameter  
            if acc > best_acc:  
                best_acc = acc  
                best_hidden = hidden  
                best_epochs = epochs  
    # Trainiere das Modell mit den besten Hyperparametern  
    model = MLPClassifier(hidden_layer_sizes=(best_hidden, best_hidden, best_hidden),  
                          max_iter=best_epochs, random_state=0)  
    model.fit(X_train, y_train)  
    return model
```

```
Python 3.11.7 | packaged by Anaconda, Inc. | (main, Dec 15 2023, 18:05:47) [MSC v.1916 64 bit (AMD64)]  
Type "copyright", "credits" or "license()" for more information.  
Python 3.11.7 -- An enhanced Interactive Python. Type "?" for help.  
In [1]: Runfile //p08/22m_klein/uni/Machine_learning/funktioniert/MultilayerPerceptron.py --wdir  
Hyperparameter_tuning_grid_method.py --wdir  
2025-06-27 14:06:42.783816: I tensorflow/core/util/port.cc:153] oneDNN custom operations are on. You may  
see slightly different numerical results due to floating-point round-off errors from different  
computation orders. To turn them off, set the environment variable 'TF_ENABLE_ONEDNN_OPTS=0'.  
2025-06-27 14:06:42.809924: I tensorflow/core/util/port.cc:153] oneDNN custom operations are on. You may  
see slightly different numerical results due to floating-point round-off errors from different  
computation orders. To turn them off, set the environment variable 'TF_ENABLE_ONEDNN_OPTS=0'.
```



Ob KI und Data Science,  
Finanzbranche,  
Softwareentwicklung  
oder Technik:  
**Gestalte deine Zukunft!**



**Jetzt  
mehr erfahren!**

Werde Problemlöser\*in  
von morgen und  
informiere dich jetzt über  
den Studiengang  
**Angewandte Mathematik**  
an der BHT.