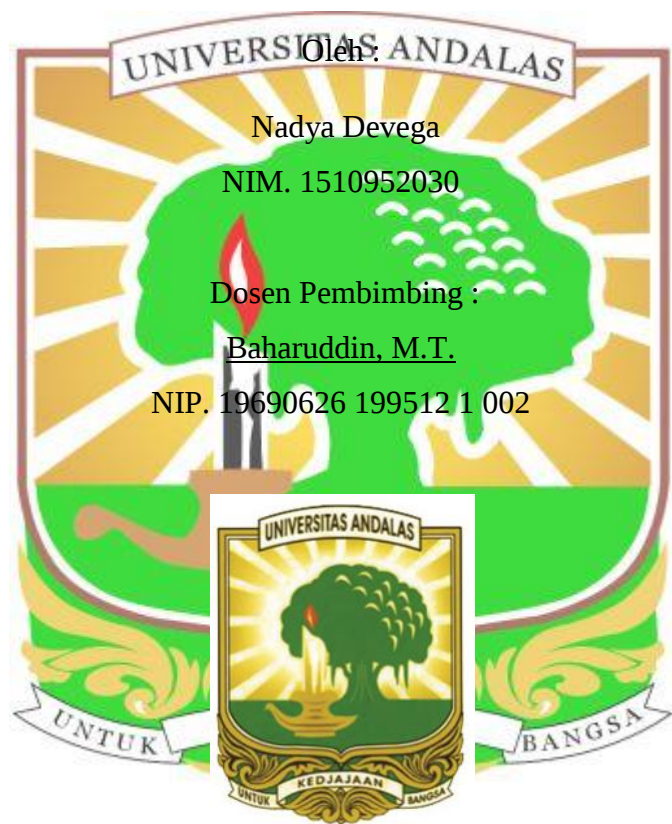


**ANALISA KINERJA TRELLIS CODE MODULATION DAN TEKNIK  
DIVERSITY MAXIMUM RATIO COMBINING PADA SISTEM TRANSMISI  
CITRA MELALUI KANAL RAYLEIGH FADING**

**TUGAS AKHIR**

Karya Ilmiah sebagai salah satu syarat untuk menyelesaikan jenjang strata satu  
(S-1) di Jurusan Teknik Elektro, Fakultas Teknik, Universitas Andalas

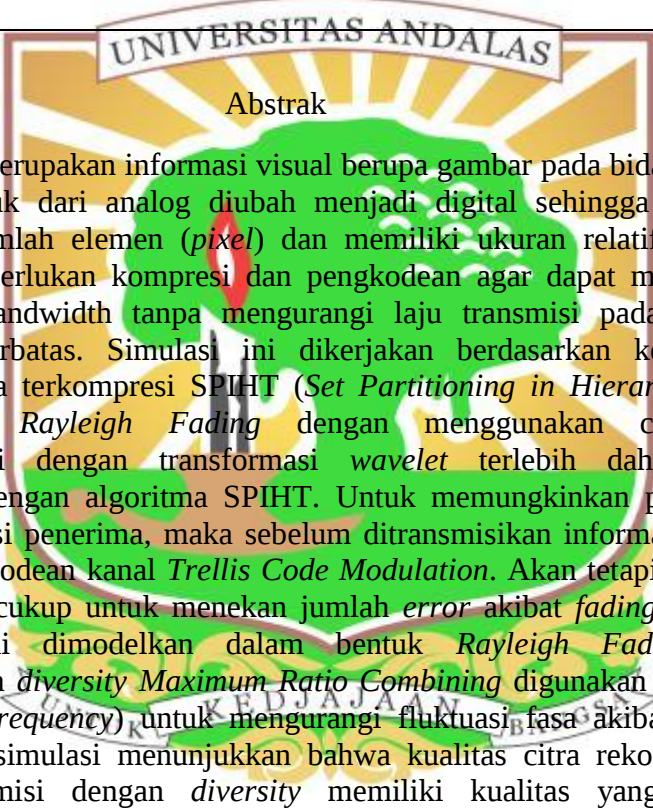


**Program Studi Sarjana Teknik Elektro**

**Fakultas Teknik**

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**2019**

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| Judul                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Analisa Kinerja Trellis Code Modulation Dan Teknik Diversity Maximum Ratio Combining Pada Sistem Transmisi Citra Melalui Kanal Rayleigh Fading | Nadya Devega |
| Program Studi                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Teknik Elektro                                                                                                                                 | 1510952030   |
| Fakultas Teknik                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                |              |
| Universitas Andalas                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                |              |
|  <p>Abstrak</p> <p>Citra merupakan informasi visual berupa gambar pada bidang 2 dimensi yang terbentuk dari analog diubah menjadi digital sehingga citra terbagi menjadi sejumlah elemen (<i>pixel</i>) dan memiliki ukuran relatif besar. Pada penelitian diperlukan kompresi dan pengkodean agar dapat mengefektifkan pemakaian bandwidth tanpa mengurangi laju transmisi pada kanal yang ukurannya terbatas. Simulasi ini dikerjakan berdasarkan keadaan nyata transmisi citra terkompresi SPIHT (<i>Set Partitioning in Hierarchical Trees</i>) pada kanal <i>Rayleigh Fading</i> dengan menggunakan citra <i>goldhill</i> didekomposisi dengan transformasi <i>wavelet</i> terlebih dahulu sebelum dikompresi dengan algoritma SPIHT. Untuk memungkinkan pengkoreksian <i>error</i> pada sisi penerima, maka sebelum ditransmisikan informasi dikodekan dengan pengkodean kanal <i>Trellis Code Modulation</i>. Akan tetapi, pengkodean kanal belum cukup untuk menekan jumlah <i>error</i> akibat <i>fading</i>, yang dalam penelitian ini dimodelkan dalam bentuk <i>Rayleigh Fading</i>. Metode penggabungan <i>diversity Maximum Ratio Combining</i> digunakan pada wilayah RF (<i>Radio Frequency</i>) untuk mengurangi fluktuasi fasa akibat <i>fading</i> dan <i>noise</i>. Hasil simulasi menunjukkan bahwa kualitas citra rekonstruksi pada sistem transmisi dengan <i>diversity</i> memiliki kualitas yang lebih baik dibandingkan sistem tanpa <i>diversity</i>.</p> <p>Kata kunci : Citra, Wavelet, SPIHT, <i>Trellis Code Modulation</i>, <i>Maximum Ratio Combining</i>, <i>Rayleigh Fading</i>, AWGN</p> |                                                                                                                                                |              |

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| Title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Trellis Code Modulation<br>Performance Analysis and<br>Technique of Diversity Maximum<br>Ratio Combining in Rayleigh<br>Fading Channel Image<br>Transmission Systems | Nadya Devega |
| Mayor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Electrical Engineering                                                                                                                                               | 1510952030   |
| <div>Electrical Engineering</div> <div>UNIVERSITAS ANDALAS</div> <div>Andalas University</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                      |              |
| <div>Abstract</div> <p>The image is visual information in the form of images in the 2-dimensional field formed from analogs converted into digital so that the image is divided into a number of elements (pixels) and has a relatively large size. In this research, compression and coding are needed in order to be able to streamline bandwidth usage without reducing transmission rates on channels of limited size. This simulation is done based on the real situation of SPIHT compressed image transmission on Rayleigh Fading channel using goldhill image decomposed by wavelet transformation before being compressed with the SPIHT algorithm. To allow correction of errors on the receiving side, before being transmitted the information is encoded with the Trellis Code Modulation channel coding. However, channel coding is not enough to suppress the number of errors due to fading, which in this study is modeled in the form of Rayleigh Fading. Diversity Maximum Ratio Combining method is used in the RF (Radio Frequency) region to reduce phase fluctuations due to fading and noise. Simulation results show that the quality of reconstruction images in transmission systems with diversity has better quality than systems without diversity.</p> <p>Keywords : Image, Wavelet, SPIHT, <i>Trellis Code Modulation, Maximum Ratio Combining, Rayleigh Fading, AWGN</i></p> |                                                                                                                                                                      |              |